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Family Poverty, Parental Involvement in Education, and the Transition to Elementary School

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Family Poverty, Parental Involvement in Education, and the Transition to Elementary School

by

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This dissertation is dedicated to my loving husband and parents.

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The purpose of this dissertation was to investigate the educational lives of economically disadvantaged children during the transition to elementary school. Past research has demonstrated that poor children begin school with lower cognitive skills than their more advantaged peers and that the gap between poor and non-poor children widens as they move through the American educational system. Less is known, however, about how poverty influences children's early education, who is most/least at risk, and what can be done to improve the educational chances of poor children. This dissertation addressed these issues by drawing on a core theoretical perspective of human development—the family process model—to examine the transition to elementary school. Specifically, in three related studies, I used data from the Early Childhood Longitudinal Study – Kindergarten Cohort to investigate: (1) parental involvement in education as a family process that mediated the association between family poverty and children's early achievement, (2) racial/ethnic differences in the academic importance of parental

involvement, and (3) parent and child characteristics that protected against the negative impact of family poverty on parental involvement.

In Study 1, I found that school-based parental involvement significantly mediated the association between poverty and children's first grade math and reading achievement and third grade reading achievement. Home-based parental involvement, however, did not explain the negative effects of poverty on early achievement. In Study 2, school-based parental involvement significantly mediated the link between poverty and math and reading achievement in first grade and reading achievement in third grade in European American families. School-based parental involvement also explained the association between poverty and African American children's first grade math achievement. School-based parental involvement was not a significant mediator for Asian American or Latino/a families. Consistent with the findings for the full sample, home-based parental involvement did not mediate the association between poverty and early achievement for any racial/ethnic population in this study. In Study 3, parents who held high academic expectations were more involved in their children's education. In addition, the association between children's interpersonal skills and parental involvement was stronger for poor families than for their more affluent counterparts.

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Chapter 1

Introduction

An especially disconcerting irony of American education is that the groups who would benefit most from educational credentials are the least likely to attain them. Compared to their more affluent peers, economically disadvantaged youth are less likely to graduate from high school or enter into higher education (Mayer, 1997; McLoyd, 1998). Failure to obtain the education credentials necessary for employment in the modern American economy is especially devastating for economically disadvantaged youth because it potentially prevents them from ever attaining a life outside of poverty. In this way, poor academic achievement contributes to the intergenerational cycle of poverty, which has enormous costs to children, families, and society (Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Huston, 1999; McLoyd, 1998). This irony of our educational system constrains the life trajectories of children, hinders the social mobility of families, and undermines educational and social service systems (Kozol, 1991).

Social science researchers have an important role to play in understanding how poverty influences educational outcomes, who is most at risk, and what can be done to improve the educational chances of economically disadvantaged children. This dissertation is designed to address these three issues by applying developmental theory to nationally representative data. Specifically, I draw on a core theoretical perspective of human development—the family process model (Elder, 1999; McLoyd, 1998)—to examine the transition to elementary school. In three separate but related studies, I use data from the Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K) to

investigate: (1) parental involvement in education as a family process that is hypothesized to mediate the association between family poverty and children's early math and reading achievement, (2) racial/ethnic differences in the academic significance of parental involvement, and (3) parent and child characteristics that potentially protect against the negative impact of family poverty on parental involvement.

To elaborate on the three studies of this dissertation, the goal of the first study is to address the question of how poverty influences educational outcomes. The family process model posits that poverty affects child development indirectly through its impact on family processes such as marital relationships and parenting behaviors (McLoyd, 1990). In the broad and growing literature in this area, family processes have linked poverty to a wide range of children's socioemotional and behavioral outcomes (e.g., Mistry, Vandewater, Huston, & McLoyd, 2002; Parke, et al., 2004). Few studies, however, have examined family processes that mediate the association between poverty and children's performance in school. Application of this model to the educational domain is critical because success in school represents a primary means through which social mobility can occur. Research that identifies factors contributing to the lower achievement of economically disadvantaged youth can inform social policies designed to alleviate poverty.

This study, therefore, examines the utility of the family process model for explaining academic outcomes, but with a specific focus on academic achievement during the transition to elementary school. Applying the family process model to academic outcomes at the start of formal schooling is important because this period serves as the foundation of children's educational careers and may represent a time when

learning trajectories are most malleable (Alexander & Entwisle, 1988). Furthermore, given the cumulative nature of the educational system, identifying ways to assist economically disadvantaged children during the early years of learning is critical for addressing the achievement gap between more and less advantaged youth during the later years of school.

In the family process model central to this study, family poverty is hypothesized to affect family processes which, in turn, influence early math and reading achievement. Because this study looks at educational outcomes with a specific focus on the transition to elementary school, I examine a family process related to school readiness: parental involvement in education. Parental involvement, largely defined in the literature as parents' work with schools and with their children to promote positive educational outcomes, is a strong predictor of school readiness for children from all economic backgrounds (Hill, 2001). Previous research suggests, however, that parental involvement may be especially important for economically disadvantaged youth. For example, Cooper and Crosnoe (in press) found that the positive relation between parental involvement and adolescents' academic orientation was significantly stronger in economically disadvantaged than in more affluent families. By examining the extent to which different forms of parental involvement explain the early achievement of economically disadvantaged children, I hope to identify the types of parental involvement important for assisting poor children as they transition into elementary school.

The second study of this dissertation addresses the question of who, among the economically disadvantaged, is most or least at risk. In other words, are the negative effects of poverty on academic achievement greater for subsets of the population? To

answer this question, I examine differences in parental involvement and in the effects of such involvement on early learning across racial/ethnic groups. Investigating the potential equivalence, or lack thereof, of the mediational model of family poverty, parental involvement, and early academic achievement across various racial/ethnic groups is important for several reasons. First, racial/ethnic minority families are more likely to live in poverty (Children's Defense Fund, 2003) and to experience persistent poverty than European American families (Brooks-Gunn, Duncan, & Maritato, 1997), which may influence parental responses to poverty, including parental involvement in education. Second, racial/ethnic minority parents report fewer positive experiences in their children's schools compared to European American parents (Lareau & Horvat, 1999), which likely decreases their motivation to become and stay involved in their children's schools. Third, research suggests that the effects of parenting practices on academic achievement may vary across racial/ethnic groups. For example, Dornbusch and colleagues (1987) found that the positive association between authoritative parenting and academic achievement was significantly stronger for European American children than for African American children. Thus, parents from different racial/ethnic groups with comparable economic resources may differ in their levels of involvement or in the types of involvement they employ. At the same time, children with different racial/ethnic backgrounds may also vary in their responses to parental involvement.

The purpose of the third study is to address the question of what can be done to improve the educational chances of economically disadvantaged children. If low parental involvement is a mechanism through which poverty disrupts the transition to elementary school, then what are the parent and child characteristics that protect against the negative

effects of poverty on parental involvement? Low-income parents are typically less involved in their children's educational careers compared to more affluent parents (Heymann, 2000). Differences in parental involvement, however, exist among economically disadvantaged families and are likely related to both parent and child factors. To investigate whether the association between family poverty and parental involvement in education varies across economically disadvantaged families, I examine two parental characteristics, psychological well-being and academic expectations for children, and two child characteristics, behavioral self-regulation and interpersonal skills. I expect that the negative impact of family poverty on parental involvement in education will be lower in families who report high levels of these characteristics, despite the constraints associated with living in poverty.

Thus, this dissertation is poised to shed light on the irony of the American educational system. Specifically, by examining a key process through which poverty influences educational outcomes, identifying subgroups most at need for interventions, and investigating factors that protect against the educational risks of poverty, this dissertation informs efforts to understand and combat the intergenerational transmission of poverty.

Chapter 2

Review of the Literature

This chapter provides the theoretical and empirical context of the dissertation. I begin by reviewing literature related to the general focus of the dissertation (childhood poverty) and then the specific focus (the family process model). Next, I review literature to support the different pieces of my application of the family process model: (a) the association between family poverty and the transition to elementary school, (b) the association between family poverty and parental involvement in education, and (c) the association between parental involvement and the transition to elementary school.

CHILDHOOD POVERTY IN THE UNITED STATES

At the turn of the 21st century, about one in six American children were raised in families with annual incomes that fell below the government poverty level ($18,392 for a family of four). More American children lived in poverty than children three decades ago and than children from any other industrialized nation (Children's Defense Fund, 2004). American children were also more likely to experience poverty than adults (Children's Defense Fund, 2004), and a higher proportion of young children lived in poverty compared to older children or adolescents (Arnold & Doctoroff, 2003). Although these statistics highlight the pervasiveness of childhood poverty in the United States, they do not provide a complete picture of poor American youth. Millions more families, with annual incomes just above the poverty level, also struggle to earn enough money for food and rent. Furthermore, the number of economically disadvantaged children, measured by multiple factors including family income, family structure and

educational attainment (McLanahan & Sandefur, 1994), is far greater than these basic statistics suggest.

Children from every racial/ethnic background live in poverty, but the likelihood of growing up in an impoverished family is much lower for European American children than for racial/ethnic minority children. In 2002, 31.5 % of African American, 28.6 % of Latino/a, 11 % of Asian American, and 9.4 % of European American children lived in families with incomes below the poverty level (Children's Defense Fund, 2004). Not only are African American and Latino/a children more likely to live in poverty, but they are also more likely to live in high-poverty communities and to live in poverty over longer periods of time compared to poor European American children (McLoyd, 1998).

POVERTY AND CHILD DEVELOPMENT. Growing up in poverty places children at risk for a wide range of negative developmental outcomes. A wealth of empirical evidence has documented the association between poverty and poor physical, cognitive, social, and emotional development. For example, infants born to poor families are at an increased risk for malnutrition or undernutrition (Brown & Pollitt, 1996), failure to thrive (Black & Dubowitz, 1991), and sudden infant death syndrome (Sherman, 1994). During early childhood, poverty is a significant predictor of poor performance on measures of cognitive functioning (Smith, Brooks-Gunn, & Klebanov, 1997). Children raised in impoverished families are also more likely to experience internalizing problems such as depression and anxiety and externalizing problems such as antisocial behavior compared to their middle- and upper-class peers (Samaan, 2000). Among adolescents, poverty is related to obesity and overall health (Goodman, 1999). Poor adolescents are also more

likely to become pregnant, associate with deviant peers, and experiment with illegal drugs than more affluent youth (Eamon, 2001; Sucoff & Upchurch, 1998).

As previously discussed, poverty also has a substantial negative impact on academic achievement, and the disparities between poor and more affluent children are evident at the very start of formal schooling. For example, at the beginning of kindergarten, economically disadvantaged children score significantly lower than both middle- and upper-class children on measures of math and reading achievement (Lee & Burkam, 2002), and this problem is especially pronounced for poor racial/ethnic minority children (Jencks & Phillips, 1998; Snow, Burns, & Griffin, 1998). The substantial gap in academic competencies between poor and more affluent children persists throughout their educational careers. Poor children and adolescents earn lower grades and lower scores on achievement tests; they are more likely to be placed in lower curricular tracks and special education programs; and they are less likely to graduate from high school or enter into higher education than nonpoor youth (Mayer, 1997; McLoyd, 1998).

The effects of poverty on child development likely depend on the duration and timing in which it is experienced (Elder, 1999). Several studies have documented that persistent poverty, compared to transitory poverty, is more strongly associated with poor developmental outcomes. For instance, the cognitive functioning of preschool children (Duncan, Brooks-Gunn, & Klebanov, 1994) and the academic achievement of older children (Smith et al., 1997) declines with increases in the duration of poverty. In addition, the incidence of internalizing problems (e.g., depression) and externalizing problems (e.g., aggression) increase the longer children live in poverty (Hanson, McLanahan, & Thomas, 1997; NICHD, 2005).

Less is known about the effects of timing of poverty on child development, but some research suggests that the negative impact of poverty on academic outcomes may be strongest during early childhood (Duncan & Brooks-Gunn, 2000). Specifically, low family income during early childhood, compared to later childhood and early adolescence, was more strongly associated with grade failure (Guo, Brooks-Gunn, & Harris, 1996). Similarly, Duncan and colleagues (1998) reported that the experience of poverty during the first five years of life had a significantly greater negative effect on completed years of schooling than living in an impoverished home in later years.

Thus, prior research on poverty suggests that it should be studied in early childhood, in relation to education, and with special attention to race/ethnicity. This dissertation follows these suggestions.

EXPLANATIONS FOR THE ASSOCIATION BETWEEN POVERTY AND POOR DEVELOPMENTAL OUTCOMES. Given that poverty affects child development within and across racial/ethnic groups, the next step is to understand how this occurs. Explanations for the association between poverty and children's well-being often center on the lack of material resources available to poor children and their families. For example, children raised in poverty often live in unsafe neighborhoods, attend ineffective schools, have poor diets, and receive little health care (Furstenberg, Cook, Eccles, Elder, & Sameroff, 1999; Huston, 1999; McLoyd, 1990). According to the financial capital model, poverty affects children directly by limiting material resources that are beneficial to children's development and well-being (Guo & Harris, 2000). Although some studies provide support for this model, the effects of poverty vary greatly from one outcome to another and there is little consensus among researchers regarding the size of the effects

(Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Haveman & Wolfe, 1995). Moreover, the financial capital model overlooks the possibility that one of the greatest influences of poverty may be related to nonmaterial family resources.

THE FAMILY PROCESS MODEL

A large and growing body of literature suggests that the effects of poverty on child development go beyond the material resources afforded by higher incomes (Mayer, 1997). Numerous studies have provided evidence that poverty has a strong impact on children's developmental trajectories indirectly through its negative effect on family processes (Conger & Elder, 1994; Elder, Eccles, Ardelt, & Lord, 1995; Gutman & Eccles, 1999; McLoyd, 1998; Mistry et al., 2002). Family processes, although not formally defined in the literature, often include aspects of marital and parent-child relationships. In one of the earliest studies to describe family processes that mediate the association between poverty and children's well-being, McLoyd (1990) proposed a model to examine how poverty and economic loss affects African American children's socioemotional development. According to McLoyd, impoverished families often experience an excess of adverse life events, and the resulting psychological distress diminishes parents' capacity to be supportive, consistent, and involved parents which, in turn, disrupts children's socioemotional functioning.

The general framework of this mediational model draws heavily on studies of White families of the Great Depression (Elder, 1974; Elder, 1979; Elder, Liker, & Cross, 1984; Elder, Van Nguyen, & Caspi, 1985). In several studies, Elder and colleagues examined the effects of economic loss during the Depression on children's behavioral

and socioemotional development. The results of this research indicated that economic loss had few direct effects on children's well-being. Instead, negative child outcomes occurred indirectly through the fathers' poor psychological functioning and negative parenting behaviors. Fathers who experienced severe financial loss were more likely to use punitive, rejecting, and inconsistent disciplinary practices, and these parenting behaviors were significantly related to children's socioemotional problems.

Since the pioneering work of Elder and his colleagues, family processes have linked poverty to a wide range of negative socioemotional outcomes in children and adolescents, including anxiety, depression, and poor social competence (Conger, et al., 1992; Conger, et al., 1993; Mistry et al., 2002; Parke, et al., 2004), as well as behavior problems related to compliance, impulse control, aggression, and drug use (Brody, et al., 1994; Lempers, Clark-Lempers, & Simons, 1989; Mistry et al., 2002). Although less frequently, researchers have also examined family processes that mediate the association between poverty and children's academic achievement. For example, in two studies examining the adjustment of early adolescents, Conger and colleagues (1992, 1993) found that depression and demoralization for mothers and fathers mediated the association between economic stress and parenting practices that were low in warmth, involvement, and consistency. In turn, these parenting practices were related to disruptions in the adjustment of early adolescent boys and girls, including their performance in school. In a more recent study, Gutman and Eccles (1999) reported that financial strain was significantly associated with lower levels of parental involvement in school and negative parent-adolescent relationships. These family processes mediated the relation between financial strain and adolescents' academic achievement.

One of the great advantages of the family process model is that it integrates two of the dominant developmental paradigms—ecological and life course theories—and in doing so, it bridges psychological and sociological perspectives on human development. From an ecological perspective (Bronfenbrenner, 1979), children develop within multiple and overlapping systems of context and in increasingly complex reciprocal interactions with their environment. As such, development is a product of characteristics of the child, of the environment, and of the nature of the outcome in examination (e.g., academic achievement). The family process model draws on ecological theory by examining how family processes in one context (the home) influence the lives of children in another context (the school). This model is also representative of ecological models in that it describes academic achievement as a function of both child and parent characteristics.

Developed first and most fully in the work of Glen Elder (1975, 1978), life course theory views lives as interdependent trajectories embedded in social and historical contexts (Elder, 1998). This approach also highlights the importance of transition experiences which are thought to make up life trajectories. The family process model draws on life course theory by viewing children's lives as linked to their parents. Poverty is hypothesized to affect children's achievement indirectly through its influence on parenting. This dissertation also takes a life course approach to studying children's achievement by focusing on the importance of early transitions (specifically, the transition to elementary school) for placing children on the various academic trajectories that take them to their adult social positions.

GAPS IN THE LITERATURE. Despite strong empirical and theoretical grounding for the family process model, important gaps in the literature have yet to be addressed.

For instance, only a handful of studies have explored family processes that link poverty to children's academic achievement, and most of these studies have focused exclusively on the educational experiences of older children and adolescents (for exceptions, see Foster, Lambert, Abbott-Shim, McCarty, & Franze, 2005; Linver, Brooks-Gunn, & Kohen, 2002; Mistry, Biesanz, Taylor, Burchinal, & Cox, 2004). Furthermore, the family process model has yet to be applied to academic outcomes during the transition to elementary school. The need for further research in this area is critical for several reasons. Because children are more likely to experience poverty during early childhood (Arnold & Doctoroff, 2003), and because the negative effects of poverty on developmental outcomes may be greater for younger children than older children and adolescents (Duncan et al., 1998), early childhood may represent a period when children's academic trajectories are most at risk. Additionally, the start of formal schooling may be a critical intervention point for economically disadvantaged children because it serves as the foundation of their educational careers and is a period when learning trajectories are most malleable (Alexander & Entwisle, 1988). As such, identifying the family processes that have the largest influence on academic outcomes for young economically disadvantaged children may be a first step toward addressing inequalities between poor and more affluent children prior to beginning elementary school. Furthermore, given the cumulative nature of the educational system, assisting economically disadvantaged children during the early years of learning may be essential for decreasing the achievement gap between more and less advantaged youth during the later years of school.

This dissertation, therefore, applies the family process model to a new and important educational focus: the transition to elementary school. In the following sections, I review literature related to each of the different pieces of the proposed mediational model: (a) family poverty and the transition to elementary school, (b) family poverty and parental involvement in education, and (c) parental involvement in education and the transition to elementary school.

THE TRANSITION TO ELEMENTARY SCHOOL

THE NATURE OF THE TRANSITION TO ELEMENTARY SCHOOL. The start of formal schooling represents a major life transition during early childhood. As children make the home-to-school transition, they assume the new role of student, which requires them to adapt to a new environment, negotiate new relationships with authority figures and peers, and behave based on a new set of expectations (Entwisle & Alexander, 1998). The environment that children encounter when they begin school is organized in ways that most children have not previously experienced (Entwisle & Alexander, 1998). With a large number of similar-aged peers, children meet in classrooms that may contain unfamiliar objects (e.g., desks, chalkboards, maps, educational toys) and are instructed by an unfamiliar adult. Children are also exposed to the larger school context where they may eat in the cafeteria, visit the library, have recess on the playground, or ride the bus with students who are up to six years older.

In addition to adapting to a new physical environment (i.e., how school looks), children must also learn and adjust to a new social environment (i.e., how school works) (Pianta & Cox, 1999). For example, at school, children typically have little control over

how they spend their day. For a specific period of time and following a specific schedule, children are told when to work, eat, play, and nap. Although they may have also followed a regular schedule at home or in a day-care setting, children likely have fewer choices during a typical school day.

At school, children also interact and form relationships with adults and children that are not family or friends of family. The nature of these school relationships is markedly different from that of their home relationships. For example, at home, children are evaluated primarily in terms of their own past record. In other words, a child will often receive positive feedback from a parent or caretaker when they accomplish something (e.g., counting to ten) that they were previously unable to do. At school, on the other hand, children are mainly evaluated in terms of how they compare to other children in their classroom (Entwisle & Alexander, 1999). The criteria for receiving a positive evaluation at school, however, include non-academic factors that are often outside of children's control. For instance, teachers are influenced by children's race/ethnicity and social class. In particular, affluent European American teachers are more likely to perceive low-income and racial/ethnic minority students as less motivated, behaviorally difficult, and unlikely to succeed compared to other children (Alexander, Entwisle, & Thompson, 1987; Wynne, 1999). The evaluation that a child receives may also depend on physical characteristics like weight, height, and attractiveness as well as personality characteristics like cooperativeness, attitude, and motivation (Alexander & Entwisle, 1988; Pianta & Cox, 1999).

Indeed, children are faced with many challenges during the transition to elementary school; yet, the transition to formal schooling represents an especially

important period for children's academic and social development (Pianta & Cox, 1999). In particular, children's cognitive development during early childhood and the long-lasting consequences of successful and unsuccessful transitions contribute to the critical nature of this period.

THE ACADEMIC IMPORTANCE OF THE TRANSITION TO ELEMENTARY SCHOOL. Children make larger cognitive gains during early childhood than at any other period of development. In Piaget terms (Inhelder & Piaget, 1958), as children transition from preoperational to concrete modes of operational thought, their language ability, memory span, speed of cognitive processing, and overall learning capacity develop at a rapid pace. The maturational changes in cognitive structure that occur during this time are propitious for learning to read and to understand the basic concepts of mathematics (Entwisle & Alexander, 1998). Additionally, the work of Blumenfeld and her colleagues (1982; 1986) suggests that younger children are more positive about their academic abilities and about school in general compared to older children and adolescents. Thus, if provided with a stimulating and supportive environment that encourages their intellectual growth and reinforces their positive academic attitudes, the transition to elementary school may represent a period when children are best able and willing to benefit from their academic experiences.

In addition, the transition to elementary school is critical because whether or not children are successful during this period has important and long-lasting consequences (Entwisle & Alexander, 1998). Children's experiences and performance at the start of formal schooling serve as a foundation for future academic progress, but also launch children into achievement trajectories that they follow throughout their academic lives.

Problems during this critical transitional period can be devastating. Given the cumulative nature of the curriculum, it is very difficult for children who do not perform well in the early grades to recover from their failure in later grades. For example, children who earn poor grades or repeat a grade during the early elementary school years are more likely to drop out during high school (Barnett, 1996). Furthermore, schools' records of academic and behavioral problems follow children across grades and schools, influencing teachers' beliefs and expectations which, in turn, affect children's performance in school (Entwisle & Hayduk, 1988).

Children's ability to successfully negotiate the move to elementary school plays a major role in their later achievement; yet, research suggests that many children have difficulty transitioning to the intellectual, behavioral, and social demands during this period (Pianta & Cox, 1999). For example, boys, racial/ethnic minority children, children with birthdays that were late in the year, and children who experienced developmental delays during early childhood are more likely to experience learning or behavioral problems during the first few years of formal schooling (Zill, 1999). Family characteristics that are consistently overrepresented among children with school adjustment problems include low parental education levels, family disruption, single parenthood, and family poverty (Entwisle, Alexander, & Olson, 1997; Stipek & Ryan, 1997; Zill, 1999). Transition problems are also more likely to occur in schools in high poverty communities, in inner-city or rural schools (as opposed to suburban schools), and in schools with high concentrations of racial/ethnic minority students (Pianta & Cox, 1999). Thus, a wide range of child, family, and school factors have been associated with problems during the transition to elementary school. Poverty, however, which affects

children directly and indirectly through its influence on families and schools, is of particular concern in the literature and is the focus of this dissertation.

POVERTY AND THE TRANSITION TO ELEMENTARY SCHOOL. Multiple studies have reported that children from low-income homes are more likely to experience emotional, behavioral, and academic problems in the first few years of school compared to their more affluent peers (Entwisle & Alexander, 1999; NICHD, 2005; Zill, 1999). Specifically, poverty predicts low confidence, poor communication, poor concentration, disruptive behavior, failing grades, and retention during the transition to elementary school (Zill, 1999; Zill, Loomis, & West, 1997). Since academic success in the early years is a primary means to success in the later years, school problems during the transition have a major negative influence on economically disadvantaged children's likelihood of academic success in late childhood and adolescence. The serious and enduring consequences of a poor transition to elementary school are especially problematic for economically disadvantaged children, who have fewer resources for recovering from school adjustment problems.

As previously discussed, the negative effects of poverty on academic achievement often focus on the tangible resources that economically disadvantaged children lack (e.g., nutritional food, educational resources in the home and community, effective schools, and safe neighborhoods; Furstenberg et al., 1999; Huston, 1999; McLoyd, 1990). This approach is also common in research investigating the transition to elementary school. For example, researchers have suggested that a major source of difference between poor and more affluent children in terms of adjustment and later academic problems relates to inequalities in the educational system (Entwisle & Alexander, 1999; Kozol, 1991).

Economically disadvantaged children are more likely than middle- or upper-class children to attend schools where there are extreme shortages in basic supplies, textbooks, library books, and computers. They are also more likely to have a permanent substitute with little or no teaching experience or multiple teachers in one year (Kozol, 1991).

Although the work of Kozol and other researchers who employ the financial capital model has been useful for understanding the direct effects of poverty on young children's academic achievement, past research with older children and adolescents highlights the value of understanding the processes through which family income affects academic achievement. Specifically, a small but growing body of literature suggests that family processes are key mechanisms through which poverty influences academic achievement (Conger et al., 1992, 1993; Gutman and Eccles, 1999). Yet, there is a substantial gap in the literature investigating family processes that mediate poverty and academic achievement during the transition to elementary school. This is surprising given that previous research has found significant associations between income and parenting practices in young children's homes (Bradley et al., 1994; Corwyn & Bradley, 1999; Dodge, Pettit, & Bates, 1994; Kelley, Power, & Wimbush, 1992). Moreover, the work of Alexander and Entwisle (1988, 1999), as well as others (e.g., Farkas, 1996; Lee & Burkham, 2002; Pianta & Walsh, 1996), has suggested that differences in social psychological resources, especially those related to the family, are a driving force of inequalities in early education.

Thus, one of the ways that poverty influences educational outcomes is by disrupting the transition to elementary school, which is the focus of the family process model of this dissertation. Next, I discuss the processes through which this occurs. As

already explained, many processes are part of the family process model. For this particular application, I focus on a process specifically related to academic outcomes: parental involvement in education.

PARENTAL INVOLVEMENT IN EDUCATION

Parents are a major influence on the academic trajectories of their children, and their involvement in the schooling process represents one of the ways that parents keep their children on healthy, rather than risky, academic trajectories. Parental involvement, largely defined in the literature as parents' work with schools and with their children to promote positive educational outcomes, is positively associated with a wide range of school-related outcomes including children's motivation, self-efficacy, and internal locus of control (Dickinson & DeTemple, 1998; Mantzicopoulos, 1997; Parker, Boak, Griffin, Ripple, & Peay, 1999; Suizzo & Soon, in press), prosocial and on-task behavior (Hill et al., 2004; Leach & Tan, 1996), and reading and math achievement (Eccles & Harold, 1996; Epstein & Sanders, 2002; Keith et al., 1998).

Despite empirical evidence for the benefits of parental involvement, researchers have faced many challenges in their attempts to understand the link between parental involvement and children's academic outcomes. First, definitions and measurements of parental involvement vary greatly in the literature (Kohl, Lengua, & McMahon, 2000), and research often fails to capture the complex and multidimensional nature of parents' involvement. For example, in their review of the literature, Fantuzzo and colleagues (2004) suggested that it is not uncommon for researchers to assess parental involvement

using only one or two binary items that focus solely on involvement in the school setting or teacher-reports of involvement only.

Some research in the past decade has attempted to address these concerns. In particular, Epstein's (1995) model of parental involvement emphasizes the multifaceted expressions of involvement that occur across multiple contexts, including the home, the school, and the community. Of the six types of involvement in Epstein's model, Volunteering, Communicating, and Decision-Making refer to involvement that occurs in collaboration with teachers and administrators in the school setting. Parenting, which refers to the role of parents in meeting child's basic health needs, and Learning at Home, defined as family activities that encourage intellectual growth and support formal education, are two types of involvement that occur among family members in the home or community context. The sixth type of involvement relates to community-school partnerships, which would allow for the coordination and provision of services for families, schools, and the larger community. Although researchers still struggle to clearly define and conceptualize parental involvement, the work of Epstein and others (e.g., Fantuzzo, Tighe, and Childs, 2000) has underlined the importance of research that captures the dynamic nature of parental involvement.

Second, understanding the effects of parental involvement on children's academic lives has been complicated because research has demonstrated that involvement is context-specific. In other words, the involvement employed by parents and the effects of such involvement on children's educational outcomes vary as a function of child and family characteristics. For example, research suggests that parental involvement in the school context changes as children move from elementary to secondary school.

Specifically, parents of older children, especially high-achieving adolescents, are less involved at school compared to other parents (Crosnoe, 2001; Eccles & Harold, 1996). The lower levels of school-based involvement, which appear problematic at first glance, may actually reflect the ability of parents to respond to the academic needs of their children. As another example, racial/ethnic minority parents typically report lower involvement in their children's education, but often only in terms of involvement that is visible in school settings (Eccles & Harold, 1996). Thus, the lack of involvement reported in some studies may not accurately reflect racial/ethnic minority parents' involvement, which occurs more frequently in the home or community settings.

How children respond to their parents' involvement may also depend on child and family characteristics. For example, for older children and adolescents, parental monitoring, parental support for homework, and communication between parents and children about school and future plans are the strongest predictors of positive academic outcomes (Epstein & Sanders, 2002; Falbo, Lein, & Amador, 2001; Yonezawa, 2000). Past research has also suggested that the association between parental involvement and children's academic outcomes is moderated by family income and race/ethnicity. Cooper & Crosnoe (in press), for instance, reported that the association between parental involvement in school and children's academic orientation was significantly stronger in economically disadvantaged families compared to more affluent families.

Third, although the positive effects of parental involvement on children's academic outcomes have been documented in numerous studies, little research has addressed the processes through which parental involvement affects children. Understanding how parental involvement influences children's academic lives is an

important question, and the work of Hoover-Dempsey and her colleagues (1995, 2001), in particular, has played a critical role in addressing this gap in the literature. According to these researchers, the effects of parental involvement on children's academic lives occur through three primary mechanisms: instruction, modeling, and reinforcement. They argue that these mechanisms likely influence children's educational outcomes by enhancing the learning that takes place in the classroom and by enabling learning that is less successful in the school context.

A fourth difficulty relates to understanding why some parents are not involved in their children's academic lives. Research has suggested that single parents (Astone & McLanahan, 1991), parents with lower levels of education (Suizzo & Stapleton, in press), economically disadvantaged parents (Heymann, 2000), and racial/ethnic minority parents (Ho & Willms, 1996) report lower levels of involvement (although findings vary depending on the type of involvement assessed). Yet, less is known about why these and other parents are less involved in their children's education. Some research suggests that lack of involvement may be related to teacher and school characteristics. For example, teachers' attitudes about involvement, the existence of school programs designed to increase involvement, and the organizational structure of schools are all strong predictors of parental involvement (Epstein & Dauber, 1991). Research has also documented the importance of parent characteristics, including time, energy, attitude toward the school, and economic factors (e.g., parental employment status and family income; Eccles & Howard, 1993). It is likely that many factors influence parents' involvement, or lack thereof, and that these factors will vary depending on parent and family characteristics.

Thus, parental involvement is a dynamic process that changes as children develop and varies as a function of child and parent characteristics. Involvement can occur in multiple ways and in multiple contexts. Overall, parental involvement has a substantial positive influence on the life trajectories of children and is important to both parents and schools alike. There are, however, many challenges to investigating parental involvement, including the conceptualization of involvement, the identification of processes through which involvement affects children, and the identification of factors contributing to low involvement. This study addresses this last issue with a specific focus on the involvement of economically disadvantaged families. In the following sections, I review literature related to the remaining two pieces of this dissertation's family process model: the association between family poverty and parental involvement in education and the association between parental involvement and the transition to elementary school.

ECONOMIC DISADVANTAGE AND PARENTAL INVOLVEMENT IN EDUCATION. The association between economic disadvantage and parental involvement in education is well documented (Eccles & Harold, 1993; Heymann, 2000). In general, children raised in low-income families have parents who are less involved in their educational careers than children from more affluent homes. Like explanations for low involvement in all parents, researchers attribute the involvement of economically disadvantaged parents to a wide range of parent, teacher, and school characteristics.

One of the primary reasons that economically disadvantaged parents are less involved in their children's school may relate to their prior experiences with teachers and educators. Overall, economically disadvantaged parents have fewer positive experiences

at school than middle- and upper-class parents (Lareau & Horvat, 1999). This is not surprising given teachers' negative beliefs about economically disadvantaged children and their parents. For instance, research suggests that teachers perceive children from low-income families as having more problems in school, both behaviorally and academically, and they have lower academic expectations for economically disadvantaged children than for more affluent children (Alexander et al., 1987). At the same time, teachers also perceive economically disadvantaged parents as both being less involved and less concerned about their children's educational careers compared to non-poor parents (Muller, 2001). Over time, the negative beliefs of teachers and educators may discourage economically disadvantaged parents from becoming or remaining involved in their children's school (Lareau, 2003). Equally problematic, these beliefs may also contribute to lower involvement at home if economically disadvantaged parents are reluctant to seek assistance from the school for help in managing their children's educational careers.

Although teachers and schools play a major role in the lower involvement of economically disadvantaged parents, parent and family characteristics also have a substantial effect on the involvement of low-income parents. For example, the inherent problems associated with jobs often held by economically disadvantaged individuals may constrain their ability to be consistently involved in the schooling process. Compared to more affluent individuals, economically disadvantaged parents are more likely to have physically demanding jobs. At the same time, they often work long hours and hold multiple jobs in order to make ends meet (Furstenberg et al., 1999). As a result,

economically disadvantaged parents may lack the time or energy to be as involved as they, their children, or the school would like.

Beyond the constraints associated with their employment, the social psychological resources available to economically disadvantaged parents also influence their involvement in the schooling process. For example, the beliefs that economically disadvantaged parents hold about their children's school influence their level of involvement. Specifically, the extent to which parents believe that the school is a welcoming place where teachers and administrators are sympathetic to the needs of their child and to their family situation likely influences their involvement at school (Eccles & Harold, 1993). Parents' beliefs about whether educators blame them for their child's academic or behavioral problems may also be related to their involvement (Eccles & Harold, 1993).

In addition to beliefs about the school, economically disadvantaged parents' beliefs about themselves and their children are also important for understanding involvement in the schooling process. Living in poverty, especially over long periods of time, undermines beliefs in the efficacy of parent behavior (Bandura, 1995). Compared to more affluent parents, economically disadvantaged parents believe that they have less control over their children's behavior (Elder et al., 1995). For example, they may feel less able to get their children to study or less able to keep their children out of dangerous situations than middle- or upper-class parents. Economically disadvantaged parents also feel less effective in controlling their children's environment (Elder et al., 1995). They may believe, for example, that they are unable to make positive changes in their child's school or in their family's neighborhood.

These beliefs likely influence their involvement in the schooling process. If economically disadvantaged parents believe that what they say and do have little impact on their children's behavior, they may not be motivated to assist their children with schoolwork or help their children plan for future courses. At the same time, if economically disadvantaged parents believe that they have little control over their children's experiences at school, they may be less likely to communicate with teachers or attend school events.

The impact of economic disadvantage on parents' emotional well-being goes beyond beliefs about parental effectiveness. Living in poverty also has a negative effect on parents' beliefs about their children. For example, economically disadvantaged parents are less optimistic about their children's educational chances than more affluent parents. In particular, they believe that their children are less likely to graduate from high school and less likely to enroll in higher education (Crosnoe, Mistry, & Elder, 2002). Like beliefs that parents have about themselves, the beliefs that parents have about their children may also affect their involvement in the schooling process. If parents hold negative beliefs about their children's ability to succeed in school, they may see little reason to invest in their children's educational careers (Eccles & Harold, 1993). As a result, economically disadvantaged parents who believe that their children are unlikely to graduate from high school or attend college may be less involved in the schooling process at home and in the school.

PARENTAL INVOLVEMENT AND THE TRANSITION TO ELEMENTARY SCHOOL. The past two decades have witnessed a proliferation of research investigating the association between parental involvement in education and children's educational

outcomes. Much of this research has demonstrated that parental involvement is beneficial for low- and high-achieving students across all grade levels (Crosnoe, 2001; Stevenson & Baker, 1987). For example, during early childhood, parental involvement is a strong predictor of school readiness, as measured by pre-reading skills in kindergarten (Hill, 2001) and improvements in language and literacy skills during early elementary school (Senechal & LaFevre, 2002). In later childhood and adolescence, parental involvement is associated with higher grades (Keith et al., 1998), acceptable school attendance (Epstein & Sheldon, 2002), reductions in grade retention (Miedel & Reynolds, 1999), and high school completion (Jimerson, Egeland, Sroufe, & Carlson, 2000). The benefits of parental involvement may also extend beyond the individual child. Research suggests that parental involvement has positive effects on the family and the school, two of the primary contexts in which children are embedded (Eccles & Harold, 1993). Thus, parental involvement is important, not only for its influence on children, but also for its potential effect on peers and adults in children's lives and on environments in which children live their lives.

The importance of parental involvement in education during early childhood, in particular, is widely recognized (Christenson, 1999). For example, the National Research Council (2001) calls for early childhood programs to facilitate home-school relationships as a way to promote the social, emotional, and academic development of young children. Head Start, a federally funded early intervention program for low-income children, has also identified parental involvement as a beneficial factor for young children's learning (U.S. Department of Health and Human Services, 1998).

As discussed, empirical evidence exists to support parental involvement as a key component for academic success during early childhood. At the start of formal schooling, parents can play a critical role in helping their children adapt to the intellectual and social demands of the school environment through their involvement in the schooling process. In particular, past research demonstrates that young children with highly involved parents perform significantly better on measures of pre-reading skills (Hill, 2001) and mathematical ability (Reynolds, 1992) compared to children with less involved parents. During early childhood, parental involvement is also a significant predictor of children's motivation, self-efficacy, and prosocial behavior (Dickinson & DeTemple, 1998; Fantuzzo, Tighe, & Perry, 1999; Mantzicopoulos, 1997; Parker et al., 1999).

Chapter 3

Study One: The Proposed Conceptual Model

The goal of the first study is to investigate how poverty influences educational outcomes by drawing on the family process model. As discussed in the previous chapter, existing studies have examined poverty, family processes, and children's academic achievement at the start of formal schooling. This research, however, has not been conceptually organized to explain how family income influences academic achievement during the transition to elementary school through its influence on family processes. This study addresses the gap in the literature by positing that parental involvement in education mediates the association between family poverty and children's academic achievement in early childhood.

Figure 1 presents the proposed conceptual model of the primary variables of interest for first grade achievement. Family poverty affects parental involvement in education, a family process related to academic outcomes at the start of formal schooling (Path A). Parental involvement in education, in turn, affects math and reading achievement in first grade (Path B).

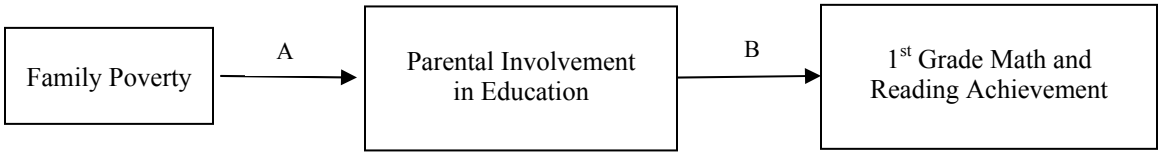


Figure 1. Proposed conceptual model for first grade math and reading achievement.

Similarly, Figure 2 presents the parallel proposed conceptual model of the primary variables of interest for third grade achievement. Extending the proposed model to academic outcomes in third grade is important because it allows for examination of whether the effects of parental involvement during the transition to school are long-lasting or limited to contemporaneous relations with achievement. Research suggests that education-related parenting practices during early childhood, which provide the foundation for children's development of schemas about school (Taylor, Clayton, & Rowley, 2004), may be a powerful determinant of subsequent achievement (Dearing, McCartney, Weiss, Kreider, & Simpkins, 2004).

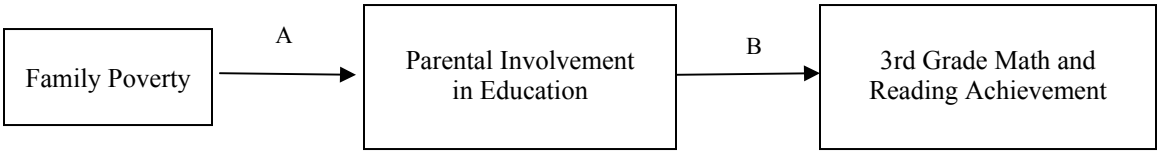


Figure 2. Proposed conceptual model for third grade math and reading achievement.

Method

DATA

The Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K) is a nationally representative sample of American kindergarteners created by the National Center for Education Statistics (NCES) with a multi-stage sampling frame. One-hundred primary sampling units (counties or groups of counties), 1000 schools within these units, and 22,782 children within these schools were selected for participation in ECLS-K (NCES, 2002). The first wave of data was collected in the fall of 1998 and included

children enrolled in part- or full-day kindergarten programs at public or private schools. Subsequent waves of data collection occurred in the spring of kindergarten, the fall of first grade (25% subsample only), the spring of first grade, the spring of third grade, and the spring of fifth grade (not yet released). At each wave of data collection, ECLS-K collected information from children, parents, teachers, and schools. The direct child assessment was conducted one-on-one at the child's school by a trained assessor and measured reading and mathematics skills and knowledge at each wave, general knowledge (i.e., science and social studies) in kindergarten and first grade, and science knowledge in third and fifth grade. To gather information from parents, a trained interviewer administered a 45-50 minute interview with the parents over the phone or in person if the family did not have a telephone. Teachers and school administrators completed a paper and pencil survey. The analytical sample of this dissertation included children who participated in both kindergarten waves as well as the first and third grade waves, who had valid sampling weights assigned to them, and who participated in cognitive assessments in each of these waves (n = 11,257).

MEASURES

COGNITIVE ACHIEVEMENT IN FIRST AND THIRD GRADE. At each wave of data collection, children completed timed assessments in reading and math. (Descriptive statistics for children's math and reading achievement, as well as for all of the other study variables, are presented in Table 1.) In first grade, the math assessment included items on numbers, shapes, relative size, ordinality, sequence, addition, subtraction, multiplication and division. The third grade math assessment added items

Table 1. Descriptive Statistics for Study Variables

Variable	Frequency (%)	*M*	*SD*
Cognitive achievement			
Math achievement: first grade		55.79	15.76
Reading achievement: first grade		69.47	20.25
Math achievement: third grade		86.17	17.41
Reading achievement: third grade		109.54	19.43
Parental involvement at home			
Building activities		2.36	0.91
Game/puzzle activities		2.79	0.82
Nature/science activities		2.23	0.87
Reading activities		3.15	0.72
Parental involvement at school		3.93	1.61
Family economic status			
100% or below the FPL	17.13		
101-200% of the FPL	21.36		
Above 200% of the FPL	61.51		
Family characteristics			
Parent education		3.03	1.15
Mother employed full-time	44.85		
Mother employed part-time	22.52		
Mother not employed	30.51		
Father employed full-time	73.93		
Father employed part-time	2.76		
Father not employed	3.90		
Family structure (two-parent)	71.39		
Individual-level control variables			
Age (years at start of school)		5.71	0.36
Gender (female)	49.48		
African American	13.38		
Asian American	6.61		
Latino/a	15.16		
European American	62.13		
Other race/ethnicity	2.22		
Year in kindergarten (first)	96.04		
Pre-K not in child care	17.14		
Pre-K relative care	13.47		
Pre-K non-relative care	10.77		
Pre-K center-care enrollment	44.32		
Pre-K Head Start enrollment	8.27		
Pre-K other type of care	4.83		
Assessment language status (Spanish)	3.00		
Timing of assessment (days from start)		63.03	15.88
School-level control variables			
School sector (private)	21.48		
School size		3.29	1.13
School socioeconomic status	16.88		
Receipt of title I funding	53.41		
School region: Midwest	26.13		
School region: Northeast	18.95		
School region: South	33.67		
School region: West	21.26		

Table 1 (continued)

Variable	Frequency (%)	*M*	*SD*
School urbancity: central city	37.53		
School urbanicity: fringe/large town	38.80		
School urbanicity: small town/rural	23.67		

Note. n = 11,257.

on place value, rate, and measurement. Scores on the first grade math assessment ranged from 9 to 107, and scores for third grade ranged from 32 to 120. The reading assessment for first grade included items on letter recognition, beginning sounds, ending sounds, sight words, and words in context. The third grade reading assessment added items on literal inference, extrapolation, and evaluation. The range for reading scores was 17 to 142 for first grade and 42 to 149 for third grade.

The direct cognitive assessment used a two-stage assessment design. At each data collection point, all children were administered the same initial reading and math assessment, consisting of 12 to 20 items with a broad range of difficulty. Based on their performance on this initial assessment, children then completed a low-, middle-, or high-difficulty assessment. The purpose of the two-stage assessment design was to maximize measurement accuracy and minimize administration time. Item Response Theory (IRT) was used to develop single proficiency scores across test sequences. The IRT parameters were based on the three parameter model with a parameter for guessing, a parameter for difficulty, and a slope parameter. This dissertation used IRT scores that were computed after the third grade data collection.

PARENTAL INVOLVEMENT IN EDUCATION. Parental involvement in education was measured in two primary contexts—the home and the school. To assess parental involvement at home, I chose indicators that measured the extent to which parents

engaged their children in learning activities in the home context. Specifically, parents were asked in the kindergarten data collection how often (1 = not at all, 2 = once or twice a week, 3 = 3 – 6 times a week, 4 = everyday) they had engaged their children in learning activities related to: (1) building, (2) games or puzzles, (3) nature or science, and (4) reading.[1] Previous research suggests that economically disadvantaged parents are less likely to read with their young children than more affluent parents (Bradley, Corwyn, McAdoo, & García Coll, 2001; Foster et al., 2005); yet, little is known about the effects of poverty on learning activities that involve building, playing games or puzzles, or talking about nature or science. The present study, therefore, contributed to the base of knowledge on home-based parental involvement by investigating whether living in poverty disrupts parents' ability to engage their children in these home learning activities and whether these activities explain the negative effects of poverty on children's achievement during the transition to elementary school.

To assess parental involvement at school, parents reported in the spring kindergarten data collection whether they had engaged (1 = yes) in the following activities since the beginning of the school year: (1) contacted the teacher, (2) attended an open-house or a back-to-school night, (3) attended a PTA, PTO, or Parent-Teacher Student Organization meeting, (4) attended a meeting of a parent advisory group or policy council, (5) attended a parent-teacher conference, (6) attended a school or class event, (7) volunteered at the school or served on a committee. The sum of the seven items served as the final scale (α = .72).

[1] These items did not load onto the same scale and were therefore examined separately.

FAMILY POVERTY. In the kindergarten data collection, parents reported their annual family income and the number of individuals in their family. To assess family poverty, these pieces of information were combined to calculate an income to needs ratio. This ratio was then compared to the federal poverty line (FPL; U.S. Census Bureau, 2002) to create three markers of family socioeconomic status (dummy variables for at or below 100%, 100-200%, and above 200% of the FPL). The advantage of this approach is that it allows for comparisons among poor, low-income, and non-poor children. This is important because the increased risk for academic problems is not only experienced by just the very poor but by those in the lower strata of economic life in this country as well (Duncan, 1991).

INDIVIDUAL-LEVEL CONTROL VARIABLES. Numerous control variables were created to account for demographic variability and to protect against spuriousness and selection. Family poverty, the primary independent variable, is conflated with many other aspects of family background and family dynamics. Consequently, any observed effects of poverty on parental involvement or on achievement may be misleading unless these other family characteristics are taken into account. Thus, I included statistical controls for family structure (two biological/adoptive parents or other), parents' educational status (1 = less than high school, 2 = high school graduation, 3 = some post-high school education, 4 = college graduate, 5 = post-graduate degree; in two-parent families, the highest value of the two parents served as the final measure), and parents' employment status (dummy variables for full-time, part-time, and no employment). I also controlled for basic demographic factors—age, gender (0 = male, 1 = female), and race/ethnicity (dummy variables for African American, Asian American, European

American, Latino/a and other)—to capture variability within the socioeconomic groups. In addition, pre-K child care arrangement (dummy variables for parental, relative, non-relative, pre-school, child-care center, Head Start, and other) was controlled to account for potential differences in pre-kindergarten experiences that could differentiate the socioeconomic groups in regard to outcomes. Finally, controls for year in kindergarten (first time or not), language status of cognitive assessment (English or Spanish), and timing of assessment (months between the first assessment given and the child's assessment) were included to account for the different conditions in which the achievement outcome was assessed.

SCHOOL-LEVEL CONTROL VARIABLES. School-level control variables were school sector (public versus private), school size (1 = 0 – 149 students, 2 = 150 – 299, 3 = 300 – 499, 4 = 500 – 749, 5 = 750 +), school Title I funding (received funding or not), school socioeconomic status (the proportion of families in a school that are at or below 100% of the FPL), school region (dummy variables for Midwest, Northeast, South, and West), and school urbanicity (dummy variables for central city, city fringe/large town, and small town/rural). These control variables were included to guard against findings of spurious associations between school characteristics and academic outcomes. Detailed descriptions of each study variable and ECLS-K variable names are provided in Appendix A.

PLAN OF ANALYSIS

Figure 3 depicts a mediational model to aid in the data analysis explanation. The explanatory variable, *X*, affects the mediating variable, *M*, which affects the outcome

variable, *Y*. The relation between *X* and *M* is represented by *a*, and the relation between *M* and *Y*, adjusted for the effect of *X*, is represented by *b*. The relation between *X* and *Y* is represented by *c*, and the relation between *X* and *Y*, adjusted for the effects of *M*, will be referred to as *c'*. In general, the causal steps approach suggests that mediation occurs when *a*, *b*, and *c* are statistically significant and when the absolute value of *c* is larger than the absolute value of *c'* (Baron & Kenny, 1986; Judd & Kenny, 1981). Although causal steps methods are commonly used to assess intervening variable effects, the purpose of this approach is to establish conditions for mediation rather than a statistical test of mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). MacKinnon and colleagues (2002), therefore, recommend testing the significance of the indirect effect by dividing the estimate of the intervening variable effect, *ab*, by its standard error.

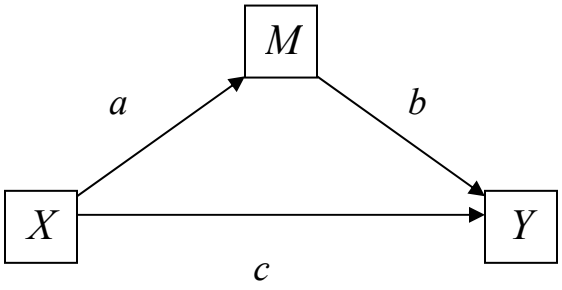


Figure 3. Mediation model in which the effect of X on Y is mediated by M.

The data analysis for the first grade achievement model proceeded in four general steps. The purpose of the first three steps was to establish the conditions for mediation outlined in the causal steps approach for each of the mediating variables. The fourth step then tested the statistical significance of each indirect effect that met these criteria.

First, each parental involvement variable was regressed on the two family poverty variables. The effects of family poverty on parental involvement, however, could be a function of family characteristics conflated with income level. As such, a necessary step in this analysis was to control for parent education, parental employment, and family structure. The significance levels of the family poverty variables indicated whether the association between family poverty and parental involvement was statistically significant after controlling for the family characteristics. The parental involvement variable was then regressed on the family poverty variables and the full set of individual- and school-level control variables to determine whether the association between family poverty and parental involvement (i.e., *a*) was statistically significant net of the control variables.

Second, the first grade achievement score was regressed on the family poverty variables. (Note that separate analyses were conducted for math and reading achievement.) As before, I then regressed first grade achievement on family poverty, parent education, parental employment, and family structure to assess whether the association between family poverty and parental involvement was statistically significant after controlling for the family characteristics. First grade achievement was then regressed on family poverty and the full set of control variables. The significance levels of the family poverty variables indicated whether the association between family poverty and first grade achievement (i.e., *c*) was statistically significant after accounting for the control variables.

Third, the parental involvement variables were added to the previous model to assess the statistical significance of the association between parental involvement and first grade achievement (i.e., *b*). Fourth, the Sobel (1982) test was used to assess the

significance of each parental involvement variable in which *a*, *b*, and *c* were statistically significant and the absolute value of *c* was greater than *c'*.

To assess whether parental involvement in education mediated the association between family poverty and third grade achievement, the steps described above were repeated, with third grade achievement serving as the dependent variable and first grade achievement serving as a control variable.

The first and third grade models were estimated in the mixed procedure, which is the SAS procedure for multilevel modeling, with individual students serving as Level 1 and schools serving as Level 2. Multilevel modeling was appropriate for this analysis because two random factors—students and schools—exist in the study design (Raudenbush & Bryk, 2002). The use of ordinary least-squares (OLS) regression, as opposed to multilevel modeling, would be problematic because the random factor of schools would be ignored and its variance component would not be included in the regression model. By doing so, the OLS approach would assume that no within-group dependency exists, an assumption not expected to hold because any two students in a school are likely to be more similar than any two randomly selected students in the population. Violation of the independence assumption would result in smaller standard error estimates, which would increase the chances for committing a Type I error. By incorporating the extra variance component (reflecting the additional random factor of schools), multilevel modeling will measure the within-group dependency that is assumed to be present in clustered data (i.e., students nested within schools) and provide more accurate standard error estimates. For readers interested in the multilevel models used in this analysis, please see Appendix B.

A final aspect of the analysis involved the use of weights. The ECLS-K is not a simple random sample (i.e., not all schools, teachers, and children had an equal probability of being selected into the sample). As a result, the use of weights was necessary to account for deviations from representativeness due to the unequal probability of sample selection (e.g., the oversampling of certain groups). Including weights in the analysis adjusted for differential selection probabilities by weighting each case relative to its representation in the population.

Results

DESCRIPTIVE ANALYSES

The goal of this first study was to investigate the proposed conceptual model of family poverty, parental involvement in education, and children's math and reading achievement in first and third grade. I expected that parental involvement in education would significantly mediate the association between family poverty and children's early academic achievement.

Before turning to the multilevel analyses that address this first study, I describe the general characteristics of economically disadvantaged children and their peers (see Table 2). For these descriptive analyses, I differentiated among poor, low-income, and non-poor children using the three markers of family poverty described earlier.[2] Across

[2] Families at or below 100% of the FPL will hereafter be referred to as "poor," consistent with the federal government designation. Based on conventions used by the NICHD Early Child Care Research Network, "low-income" will refer to families between 101 and 200% of the FPL. "Non-poor" families are families above 200% of the FPL.

Table 2. Descriptive Statistics by Level of Poverty

	Means (SD)		
	Poor	Low-Income	Non-Poor
Individual characteristics			
Age (years at start of school)	5.71	5.71	5.72
	(0.37)	(0.35)	(0.35)
Gender (% female)	51.19	48.54	49.33
	(50.00)	(49.99)	(50.00)
African American (%)	31.85[a]	16.89[a]	7.02[a]
	(46.60)	(37.47)	(25.55)
Asian American (%)	6.12	6.49	6.79
	(23.98)	(24.64)	(25.15)
Latino/a (%)	28.11[a]	20.67[a]	9.65[a]
	(44.97)	(40.51)	(29.52)
European American (%)	27.54[a]	52.83[a]	74.99[a]
	(44.68)	(49.93)	(43.31)
Family characteristics			
Parent education	2.07[a]	2.52[a]	3.47[a]
	(0.87)	(0.93)	(1.05)
Mother employed full-time (%)	34.13[a]	44.01[a]	48.13[a]
	(47.43)	(49.65)	(49.97)
Father employed full-time (%)	36.67[a]	66.22[a]	86.97[a]
	(48.20)	(47.30)	(33.66)
Family structure (% two-parent)	41.18[a]	62.98[a]	83.51[a]
	(49.23)	(48.30)	(37.11)
Cognitive achievement			
Math achievement: first grade	46.97[a]	52.12[a]	59.51[a]
	(14.16)	(14.64)	(15.29)
Reading achievement: first grade	57.85[a]	64.91[a]	74.09[a]
	(17.68)	(18.47)	(19.88)
Math achievement: third grade	74.62[a]	82.22[a]	90.46[a]
	(17.60)	(16.99)	(15.76)
Reading achievement: third grade	95.13[a]	104.62[a]	114.84[a]
	(20.47)	(18.69)	(16.94)
Parental involvement at home			
Building	2.32	2.36	2.37
	(1.01)	(0.93)	(0.88)
Games/puzzles	2.74[a]	2.74[b]	2.82[ab]
	(0.93)	(0.84)	(0.77)
Nature/science	2.07[a]	2.17[a]	2.29[a]
	(0.95)	(0.90)	(0.83)
Reading	3.07[a]	3.11[a]	3.18[a]
	(0.79)	(0.75)	(0.69)

Table 2 (continued)

	Means (SD)		
	Poor	Low-Income	Non-Poor
Parental involvement at school	2.80[a]	3.54[a]	4.38[a]
	(1.65)	(1.57)	(1.41)
n	1928	2404	6925

Note. Families at or below 100% of the FPL are "poor;" families between 101 and 200% of the FPL are "low-income;" families above 200% of the FPL are "non-poor." Means with the same superscript within each row are significantly different at $\alpha = .05$, as determined by Duncan's Multiple Range Test. Parent education ranges from 1 (less than high school) to 5 (post-graduate degree). Scores on the math assessment range from 9 to 107 for first grade and 32 to 107 for third grade. Scores on the reading assessment range from 17 to 142 for first grade and 42 to 149 for third grade. The parental involvement at home variables range from 1 to 4, and parental involvement at school ranges from 1 to 7, with higher scores indicating higher levels of involvement.

the three income groups, significant differences were found for race/ethnicity but not for age or gender. African American and Latino/a children were more likely to live in poor homes than in low-income or non-poor homes, and they were least likely to be non-poor. The opposite, however, was true for European American children. Asian American children were equally represented in the three income groups. As for the family characteristics, non-poor parents reported the highest education levels and were most likely to report full-time employment and residing in a two-parent household followed by low-income and then poor parents. On the four outcome variables, children's first and third grade math and reading achievement, significant differences were found among poor, low-income, and non-poor children. In line with expectations, poor children consistently had the lowest levels of achievement and non-poor children had the highest mean achievement scores.

With regard to parental involvement in education, as expected, non-poor parents had the highest mean scores on reading and nature/science activities followed by low-income and poor parents. On average, non-poor parents also reported engaging their children in games/puzzles more frequently than low-income or poor parents. Poor, low-

income, and non-poor parents were equally likely to work on building activities with their children. As for involvement in the school context, poor, low-income, and non-poor parents differed significantly. Non-poor parents were the most likely to be involved at their children's school and poor parents reported the least involvement.

MULTILEVEL ANALYSES

Drawing on the family process model, the goal of this first study was to investigate whether parental involvement in education mediated the association between family poverty and children's math and reading achievement in first and third grade. As discussed, the following conditions must be met for mediation to occur: (1) the association between the independent variable (i.e., family poverty) and the mediating variable (i.e., parental involvement in education) is statistically significant, (2) the association between the independent variable and the dependent variable (i.e., academic achievement) is statistically significant, (3) the association between the mediating variable and the dependent variable is statistically significant, and (4) the association between the independent variable and the dependent variable shrinks upon the addition of the mediating variable to the model.

Following the order of the four conditions, the first step was to assess the significance of the association between family poverty and each of the parental involvement variables. In Table 3, Model 1 revealed that the negative correlation between family poverty and parental involvement at school was statistically significant for poor (b = -1.22, $p < .001$) and low-income families (b = -0.59, $p < .001$). Adding the family characteristics in Model 2 reduced the poverty coefficient for the lowest income

group by about one-third, but the association between family poverty and parental involvement at school remained highly statistically significant for poor (b = -0.83, p < .001) and low-income families (b = -0.36, p < .001). Furthermore, after accounting for the full set of individual- and school-level control variables in Model 3, poor (b = -0.66, p < .001) and low-income parents (b = -0.27, p < .001) were less involved in their children's school than more affluent parents. Specifically, poor parents' school-based involvement was 0.66 points lower than that of non-poor parents. This difference represents about 40% of a standard deviation in school-based involvement. As a point of comparison, parents who did not graduate from high school reported less school-based involvement than parents who earned a high school diploma by about 0.27 points, which represents about 20% of a standard deviation in involvement. Converting the coefficients to standardized betas revealed that the effect sizes of poverty and parent education were similar in magnitude (a one standard deviation change in poverty or parent education resulted in about a 10% standard deviation change in involvement).

The results of multilevel models predicting each of the parental involvement at home variables revealed that family poverty was not significantly associated with home learning activities related to building (b = 0.04, p = .22), games/puzzles (b = -0.02, p = .53), nature/science (b = -0.05, p = .12), or reading (b = 0.03, p = .18). Failure to meet this condition for mediation suggests that involvement at home does not explain the negative impact of poverty on children's academic achievement. For each of the four outcome variables, therefore, I assessed whether parental involvement at school mediated the association between family poverty and children's academic achievement.

Table 3. Results of Multilevel Models Predicting Parental Involvement at School

Measure	Model 1	Model 2	Model 3
Family economic status			
100% or below the FPL	-1.22***	-0.83***	-0.66***
101-200% of the FPL	-0.59***	-0.36***	-0.27***
Family characteristics			
Parent education		0.30***	0.27***
Mother employed full-time		-0.21***	-0.23***
Mother employed part-time		0.16***	0.13***
Father employed full-time		0.16*	0.14*
Father employed part-time		-0.01	-0.01
Family structure (two-parent)		0.32***	0.34***
Individual-level control variables			
Age (years)			0.04
Gender (female)			0.05+
African American			-0.19***
Asian American			-0.60***
Latino/a			-0.20***
Other race/ethnicity			0.03
Year in kindergarten (first)			0.06
Pre-K relative care			0.08
Pre-K non-relative care			0.09
Center-care enrollment			0.14***
Head Start enrollment			-0.07
Other type of child care			0.12
Assessment language status (Spanish)			-0.13
Timing of assessment (days from start)			-0.003**
School-level control variables			
Sector (private)			0.14*
School size			-0.05*
School socioeconomic status			-0.82***
Receipt of Title I funding			0.15**
School region: Midwest			-0.08
School region: Northeast			-0.26***
School region: West			0.11+
School urbanicity: central city			0.15*
School urbanicity: fringe/large town			0.22***

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, European American was the reference category for race/ethnicity, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 11,257 (all models).
+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

CHILDREN'S FIRST GRADE ACHIEVEMENT. Beginning with math, Table 4 presents the results of multilevel models predicting children's first grade math achievement. As before, the poverty coefficient was reduced after controlling for family characteristics but remained highly statistically significant. Model 3 assessed whether the negative association between family poverty and first grade math achievement was statistically significant after accounting for the full set of individual- and school-level control variables. As expected, family poverty was negatively related to first grade math achievement for poor (b = -3.38, p < .001) and low-income children (b = -1.94, p < .001) net of the control variables. Specifically, poor children's first grade math achievement score was 3.38 points lower than that of non-poor children, which represents about one-fifth of a standard deviation in first grade math. Standardizing the poverty coefficient suggests that the difference between poor and non-poor children in their first grade math achievement after accounting for the full set of control variables is about 1% of a standard deviation in first grade math. Although this effect size is not large in magnitude, it is comparable to the corresponding effect of parental education, which is the strongest predictor of first grade math achievement. In short, family poverty does not powerfully predict first grade math, but it is one of the best predictors in this study.

Model 4 added the parental involvement variables to determine the significance of the association between parental involvement at school and children's first grade math achievement. Parental involvement at school was significantly related to children's first grade math achievement (b = 0.82, p < .001; one standard deviation increase in parental involvement associated with 1% of a standard deviation increase in first grade math achievement). Model 4 also revealed that the poverty coefficient was reduced for poor

and low-income families after adding parental involvement at school to the model. Having met the four conditions outlined above, my next step was to test the significance of the indirect effect. Parental involvement at school significantly mediated the association between family poverty and children's first grade math achievement in poor (z = -7.32, p < .001) and low-income families (z = -5.57, p < .001).

Turning to children's first grade reading achievement in Table 5, the inverse association between family poverty and first grade reading was statistically significant for poor (b = -5.70, p < .001) and low-income children (b = -2.19, p < .001) after adding the important individual- and school-level factors in Model 3. As before, the difference between poor and non-poor children in first grade reading achievement was about 1% of a standard deviation in first grade reading and was relative in magnitude to the effect of parental education on first grade reading. Adding the parental involvement variables in Model 4 reduced the poverty coefficient for both income groups. Consistent with the findings for math, parental involvement at school was significantly correlated with children's first grade reading achievement (b = 0.72, p < .001; one standard deviation increase in parental involvement associated with about 1% of a standard deviation increase in first grade math achievement) and significantly mediated the association between family poverty and first grade reading for poor (z = -5.33, p < .001) and low-income families (z = -4.52, p < .001).

Table 4. Results of Multilevel Models Predicting First Grade Math Achievement

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-9.80***	-5.92***	-3.38***	-2.84***
101-200% of the FPL	-5.66***	-3.19***	-1.94***	-1.71***
Family characteristics				
Parent education		3.50***	3.01***	2.79***
Mother employed full-time		-0.77*	-0.49	-0.31
Mother employed part-time		0.74+	0.62	0.52
Father employed full-time		1.82*	1.14	1.03
Father employed part-time		1.55	0.95	0.97
Family structure (two-parent)		1.79***	1.70***	1.43**
Individual-level control variables				
Age (years)			7.89***	7.85***
Gender (female)			-0.93***	-0.97***
African American			-6.16***	-6.01***
Asian American			-1.44+	-0.96
Latino/a			-2.72***	-2.56***
Other race/ethnicity			-4.19***	-4.23***
Year in kindergarten (first)			4.38***	4.32***
Pre-K relative care			-0.19	-0.25
Pre-K non-relative care			1.06+	0.99+
Center-care enrollment			1.10**	1.05*
Head Start enrollment			-1.97***	-1.91***
Other type of child care			-0.62	-0.72
Assessment language status (Spanish)			-5.07***	-4.94***
Timing of assessment (days from start)			0.05***	0.05***
School-level control variables				
Sector (private)			0.96	0.85
School size			0.42*	0.47*
School socioeconomic status			-3.74**	-3.08*
Receipt of Title I funding			-0.54	-0.65
School region: Midwest			-0.87	-0.80
School region: Northeast			-2.95***	-2.73***
School region: West			-1.05+	-1.14*
School urbanicity: central city			1.41*	1.28*
School urbanicity: fringe/large town			1.31*	1.13*
Parental involvement at school				0.82***
Level 1 variance	197.77	189.37	179.13	178.12

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; European American was the reference category for race/ethnicity; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. Level 1 variance for the unconditional model was 203.82. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5. Results of Multilevel Models Predicting First Grade Reading Achievement

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-12.49***	-8.06***	-5.70***	-5.21***
101-200% of the FPL	-6.30***	-3.51***	-2.19***	-1.99***
Family characteristics				
Parent education		3.96***	3.32***	3.13***
Mother employed full-time		-1.50***	-1.39**	-1.22**
Mother employed part-time		0.44	0.41	0.31
Father employed full-time		3.19***	2.79**	2.69**
Father employed part-time		2.24+	2.11	2.11
Family structure (two-parent)		2.72***	2.39***	2.15***
Individual-level control variables				
Age (years)			7.03***	7.00***
Gender (female)			3.81***	3.77***
African American			-2.25***	-2.12***
Asian American			3.69***	4.10***
Latino/a			-2.11***	-1.97**
Other race/ethnicity			-3.88**	-3.92**
Year in kindergarten (first)			7.03***	7.05***
Pre-K relative care			-0.19	-0.24
Pre-K non-relative care			0.88	0.82
Center-care enrollment			1.30*	1.20*
Head Start enrollment			-1.76*	-1.70*
Other type of child care			0.49	0.41
Timing of assessment (days from start)			0.07***	0.07***
School-level control variables				
Sector (private)			1.51+	1.41
School size			0.01	0.03
School socioeconomic status			-11.56***	-10.96***
Receipt of title I funding			-0.91	-1.01
School region: Midwest			-2.48***	-2.42**
School region: Northeast			-3.14***	-2.96***
School region: West			-0.81	-0.88
School urbanicity: central city			2.12**	2.01**
School urbanicity: fringe/large town			1.31+	1.15+
Parental involvement at school				0.72***
Level 1 variance	320.47	309.60	299.54	298.83

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; European American was the reference category for race/ethnicity; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. Level 1 variance for the unconditional model was 329.76. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

CHILDREN'S THIRD GRADE ACHIEVEMENT. Having presented the models for children's achievement at the start of formal schooling, I now focus on children's third grade achievement. (Note that all third grade models control for first grade

achievement.) Beginning with math in Table 6, Model 3 revealed that poor children had significantly lower math achievement than their non-poor peers after accounting for the full set of individual- and school-level control variables (b = -1.71, p < .001; the difference between poor and non-poor children in third grade math achievement was about 1% of a standard deviation). Living in a low-income home, however, was not associated with lower levels of math. In Model 4, parental involvement at school was not significantly related to third grade math, suggesting that parental involvement, whether at home or at school, does not explain the association between family poverty and children's third grade math achievement.

Table 7 presents the results of multilevel models predicting children's third grade reading achievement. In Model 3, poverty was negatively correlated with third grade reading net of the control variables for poor children (b = -2.78, p < .001; the difference between poor and non-poor children in third grade reading achievement was about 1% of a standard deviation in third grade reading) but not for children living in low-income homes. The association between parental involvement at school and third grade reading was statistically significant in Model 4 (b = 0.36, p < .001; one standard deviation increase in parental involvement associated with about 1% of a standard deviation increase in first grade math achievement), and adding parental involvement at school reduced the poverty coefficient from the previous model for poor families. In line with the findings for the first grade reading achievement of poor children, parental involvement at school significantly mediated the association between family poverty and third grade reading for children living in poor homes (z = -3.60, p < .001).

Table 6. Results of Multilevel Models Predicting Third Grade Math Achievement

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-4.32***	-3.12***	-1.71***	-1.68***
101-200% of the FPL	-1.10***	-0.34	0.22	0.23
Family characteristics				
Parent education		1.11***	0.97***	0.96***
Mother employed full-time		-0.51+	-0.52+	-0.50+
Mother employed part-time		0.13	0.02	0.02
Father employed full-time		0.01	-0.21	-0.21
Father employed part-time		0.39	0.24	0.25
Family structure (two-parent)		0.95*	0.81*	0.80*
Child-level control variables				
First grade math achievement	0.83***	0.81***	0.79***	0.79***
Age (years)			-1.18***	-1.18***
Gender (female)			-2.35***	-2.36***
African American			-3.32***	-3.31***
Asian American			0.63	0.65
Latino/a			0.13	0.14
Other race/ethnicity			-1.55+	-1.56+
Year in kindergarten (first)			2.32***	2.32***
Pre-K relative care			-0.19	-0.20
Pre-K non-relative care			1.53***	1.53***
Center-care enrollment			0.95**	0.94**
Head Start enrollment			-1.30**	-1.29**
Other type of child care			1.05+	1.05+
Assessment language status (Spanish)			-3.57***	-3.56***
Timing of assessment (days from start)			-0.05***	-0.05***
School-level control variables				
Sector (private)			-2.14***	-2.15***
School size			0.27	0.28+
School socioeconomic status			-4.43***	-4.39***
Receipt of title I funding			-0.67+	-0.68+
School region: Midwest			-0.13	-0.13
School region: Northeast			0.58	0.59
School region: West			0.30	0.29
School urbanicity: central city			1.30**	1.29**
School urbanicity: fringe/large town			0.68	0.67
Parental involvement at school				0.04

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; European American was the reference category for race/ethnicity; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 7. Results of Multilevel Models Predicting Third Grade Reading Achievement

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-6.91***	-4.42***	-2.49***	-2.27***
101-200% of the FPL	-3.10***	-1.56***	-0.58	-0.46
Family characteristics				
Parent education		2.09***	1.87***	1.78***
Mother employed full-time		-0.11	0.03	0.13
Mother employed part-time		0.26	0.12	0.09
Father employed full-time		1.28+	0.87	0.85
Father employed part-time		1.58	1.39	1.44
Family structure (two-parent)		0.01	-0.14	-0.26
Individual-level control variables				
First grade reading achievement	0.65***	0.63***	0.61***	0.61***
Age (years)			0.66	0.65
Gender (female)			1.53***	1.51***
African American			-4.47***	-4.39***
Asian American			-3.35***	-3.13***
Latino/a			-1.66***	-1.58**
Other race/ethnicity			-3.13**	-3.16**
Year in kindergarten (first)			2.37**	2.36**
Pre-K relative care			-0.11	-0.16
Pre-K non-relative care			1.77**	1.72**
Center-care enrollment			0.73+	0.67
Head Start enrollment			-1.01+	-0.99+
Other type of child care			-0.09	-0.15
Timing of assessment (days from start)			-0.05***	-0.05***
School-level control variables				
Sector (private)			-1.10+	-1.15*
School size			0.23	0.25
School socioeconomic status			-6.79***	-6.51***
Receipt of title I funding			-0.49	-0.55
School region: Midwest			0.14	0.18
School region: Northeast			0.28	0.36
School region: West			-0.06	-0.10
School urbanicity: central city			0.42	0.35
School urbanicity: fringe/large town			0.19	0.10
Parental involvement at school				0.36***
Level 1 variance	157.49	154.49	153.35	153.11

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; European American was the reference category for race/ethnicity; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. Level 1 variance for the unconditional model was 159.94. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

To summarize, this study investigated whether parental involvement in education mediated the association between family poverty and children's math and reading achievement in first and third grade. I found that family poverty was negatively related to parental involvement at school but not involvement in the home context. As discussed, this finding suggests that involvement at home does not explain the association between family poverty and children's early achievement as expected. Parental involvement at school, however, significantly mediated the link between family poverty and children's math and reading achievement during the transition to elementary school. Involvement at school was also a significant mediator of the association between family poverty and children's third grade reading achievement, controlling for prior reading achievement.

Chapter 4

Study Two: An Investigation of Model Equivalence across Racial/Ethnic Groups

Regardless of how academic success is defined, children raised in poverty encounter more problems in school than their more affluent peers (Mayer, 1997; McLoyd, 1998). As previously discussed, a substantial body of literature has examined the family processes linking poverty to developmental outcomes, including children's academic achievement (Conger et al., 1992, 1993; Mistry et al., 2002; Parke et al., 2004). These studies have provided excellent theoretical models describing the mediational role of family processes in linking poverty to poor development. The majority of these studies, however, have failed to test the empirical adequacy of their mediational models for different racial/ethnic groups (see Gutman & Eccles, 1999, as a notable exception). Because these researchers focused exclusively on within-group analyses, it has been difficult to determine how robust their findings were across these different groups.

The second study of this dissertation extends previous research by investigating the role that parental involvement in education plays in linking poverty to academic achievement during the transition to elementary school for African American, Asian American, European American, and Latino/a families. Investigating the equivalence of the proposed conceptual model across the various racial/ethnic groups is necessary for several reasons. Perhaps most important, research suggests that both the effects of poverty on parental involvement in education and the effects of parental involvement on children's academic achievement likely vary across racial/ethnic groups (Brody and Flor,

1998; Parke et al., 2004; McLoyd, 1998). Although this research highlights the need to conduct between-group analyses, it does not allow for the development of specific hypotheses for each of the four races/ethnicities. As such, it should be noted that although racial/ethnic differences in the mediational model are expected, this study is largely exploratory. In the following sections, I discuss research to support the investigation of the proposed model across race/ethnicity.

THE EFFECTS OF POVERTY ON PARENTAL INVOLVEMENT IN EDUCATION

As already discussed, the likelihood of growing up in an economically disadvantaged home is much higher for racial/ethnic minority children compared to European American children (Children's Defense Fund, 2004). Furthermore, poor African American and Latino/a children are more likely to live in persistent poverty and to live in areas of concentrated poverty than their European American counterparts (McLoyd, 1998). As a result, the negative effects of poverty on parental involvement may be significantly stronger for racial/ethnic minority families, especially African American and Latino/a families, compared to European American families.

Factors linked to past and present racial/ethnic discrimination are also likely to modify parental response to poverty. For example, impoverished racial/ethnic minority families are more likely to live in isolated urban communities than their European American counterparts (Kozol, 1991; McLoyd, 1998). The lack of resources in these communities may contribute to differences in the level of or types of involvement employed by different racial/ethnic parents. An additional factor relates to the discrimination that some racial/ethnic minority parents encounter in the school context.

Compared to European American parents, racial/ethnic minority parents have fewer positive experiences at school (Lareau & Horvat, 1999). Previous research suggests that these experiences may be related to the beliefs that teachers hold about racial/ethnic minority children and their parents. For example, some teachers and school administrators, regardless of their racial/ethnic background, perceive children from racial/ethnic minority families as having more behavioral and academic difficulties, and they have lower academic expectations for them than for European American children. At the same time, racial/ethnic minority parents are viewed to be less involved in and less concerned with their children's education than other parents (Emihovich, 1983; Kozol, 1991). As a result, the school may not be welcoming to these families, which may decrease their motivation for involvement.

THE EFFECTS OF PARENTAL INVOLVEMENT ON CHILDREN'S ACHIEVEMENT

A second reason for testing the equivalence of the proposed model is that the effects of parental involvement on children's academic achievement may vary across different racial/ethnic groups. Past research has demonstrated that parents from diverse racial/ethnic backgrounds engage in many of the same education-related parenting behaviors, especially in the home context. For example, regardless of their race/ethnicity, parents read with their young children, help their older children and adolescents with homework, and have conversations with their children about school (Ho & Willms, 1996; Okagaki & Frensch, 1998; Suizzo & Stapleton, in press). Racial/ethnic differences, however, appear to exist in parents' education-related beliefs and expectations and in the approaches used to support their children's education.

Beginning with Asian American parents, studies across a range of ethnic subgroups have found that Asian American parents have higher expectations for their children's performance in school and for their overall educational attainment than parents from any other racial/ethnic group (Chao, 1996; Chen & Stevenson, 1995; Kao, 1995; Okagaki & Frensch, 1998). Asian American parents also tend to have higher expectations for the amount of effort their children should put forth on school-related activities (Schneider & Lee, 1990), which is not surprising given their belief in the importance of effort (as opposed to ability) for academic success (Chen & Stevenson, 1995; Stevenson & Lee, 1990). In the home context, Asian American parents have been found to support their children's education in ways that reflect the high expectations and aspirations they hold for their children. For example, using high levels of control and warmth, Asian American parents structure and monitor their children's after-school and weekend hours to maximize time spent on academic-related activities (Chao, 2000; Ho & Willms, 1996; Stevenson & Lee, 1990).

European American parents, on the other hand, tend to believe that ability is most instrumental to success in school (Stevenson & Lee, 1990). Compared to other racial/ethnic groups, European American parents also place a great deal of emphasis on the development of autonomy in their children (Okagaki & Sternberg, 1993). As such, they tend to interact with their children around education-related activities in ways that are less direct and controlling. For example, European American parents create educational opportunities and experiences for their children, while simultaneously granting them high levels of autonomy (Harkness, Super, & Keefer, 1992; Hess, Holloway, Dickson, & Price, 1984). More than parents from any other racial/ethnic

groups, European American parents also support their children's education through involvement in the school context (e.g., communicating with teachers and attending school events; Ho & Willms, 1996).

Research on African Americans suggests that these parents place a high value on education (McAdoo, 2002). Like Asian American parents, African American parents hold high aspirations for their children's educational attainment (Fan, 2001). African American parents also emphasize perseverance in the face of adversity (McAdoo, 2002) and academic achievement as a means to overcome barriers associated with racism and discrimination (Suizzo, Robinson, & Pahlke, 2006). Although less involved in their children's education in the school context, African American parents report higher levels of home-based involvement than parents from any other racial/ethnic background (Ho & Willms, 1996; Jeynes, 2003). In general, African American parents combine strict and controlling parenting practices with high levels of warmth and acceptance (Brody & Flor, 1998). They also use direct methods of instructing and assisting their children with education-related activities (Harris, Terrel, & Allen, 1999).

In studies of Latino/a families, parents report high levels of concern about their children's education and a strong desire to help their children with school (Azmitia, Cooper, García, & Dunbar, 1996; Bempechat, Graham, & Jiminez, 1999; Sánchez & López, 1999). Compared to other parents, however, they are less likely to believe that their assistance contributes to their children's achievement (Stevenson, Chen, & Uttal, 1990). The lower self-efficacy of some Latino/a parents, especially as it relates to involvement at school, may be related to parents' limited familiarity with English and schools' lack of resources for Spanish-speaking parents (Carreón, Drake, & Barton,

2005). Research on Latino/a parents also suggests that first generation parents perceive obedience and respect for authority figures, including teachers, to be desirable qualities for their children (Arcia & Johnson, 1998; Delgado & Ford, 1998) and important for academic success (Okagaki & Sternberg, 1993).

Although individuals within racial/ethnic groups vary greatly (Chao & Tseng, 2002; Harwood, Leyendecker, Carlson, Asencio, & Miller, 2002), the education-related beliefs and approaches of parents within these groups may result in differential effects of parental involvement on achievement across race/ethnicity. Indeed, past research has demonstrated that race/ethnicity moderates the association between parenting and developmental outcomes. For example, in a study that examined child adjustment in European American and Mexican American families, the association between strict controlling parenting practices and adjustment problems was statistically significant for European American families but not for Mexican American families (Parke et al., 2004). Studies investigating parenting practices and educational outcomes have also reported differential effects for European American and racial/ethnic minority parents. In one of the first studies to look at parenting strategies across racial/ethnic groups, Dornbusch and colleagues (1987) reported that the positive relation between authoritative parenting and children's academic achievement was significantly stronger for European American children than for racial/ethnic minority children. In a more recent study, Brody and Flor (1998) found that the positive association between authoritarian parenting and children's self regulation and social competence in school was statistically significant for African American children but not for European American children.

A final reason for investigating the applicability of the proposed model for multiple racial/ethnic groups relates to the theoretical grounding of the family process model. By examining whether a development model varies across subsets of the population, this study remains true to the merging of psychology and sociology at the heart of the family process model.

Method

MEASURES

RACE/ETHNICITY. During the kindergarten data collection, parents reported their children's race/ethnicity. Because some children were reported as having more than one race/ethnicity, I created a five-category variable in which each child was assigned to only one racial/ethnic category. Based on conventions in the National Longitudinal Study of Adolescent Health, this system sets a priority for each racial/ethnic category. For example, Latino/a is prioritized over European American; therefore, children listed as both Latino/a and European American were designated as Latino/a. This variable was then recoded into dummy variables for African American, Asian American, European American, Latino/a, and Other race/ethnicity.

PLAN OF ANALYSIS

To assess the applicability of the family process model for African American, Asian American, Latino/a, and European American families, the analyses steps outlined in the previous chapter were employed for each racial/ethnic group.

Results

DESCRIPTIVE ANALYSES

The goal of the second study was to investigate the equivalence of the proposed mediational model of family poverty, parental involvement in education, and children's early academic achievement for African American, Asian American, Latino/a, and European American families. Before discussing the multilevel analyses that address this goal, I describe the general characteristics of children from each of the four racial/ethnic groups (see Table 8). Significant differences were found across race/ethnicity in the means of all variables except gender. European American children were least likely to live in a poor or low-income home followed by Asian American, Latino/a, and African American children, although African American and Latino/a children were equally likely to live in a low-income home.

Mean scores on parent education, highest to lowest, were Asian American, European American, African American, and Latino/a. African American and Asian American mothers were more likely to work full-time than Latino/a or European American mothers. European American and Asian American fathers were the most likely to report full-time employment followed by Latino/a and then African American fathers. Family structure significantly differentiated the four racial/ethnic groups, with Asian American children most likely to live in two-parent households followed by European American, Latino/a, and African American children.

The rank order for the four measures of achievement was (1) European American, (2) Asian American, (3) Latino/a, and (4) African American, with the exception of Asian

Table 8. Descriptive Statistics by Race/Ethnicity

	Means (SD)			
	African American	Asian American	Latino/a	European American
Individual characteristics				
Age (years at start of school)	5.70[a]	5.59[a]	5.65[a]	5.74[a]
	(0.35)	(0.33)	(0.35)	(0.36)
Gender (% female)	51.33	50.54	49.79	48.94
	(50.00)	(50.00)	(50.01)	(49.99)
Family economic status				
100% or below the FPL (%)	40.77[a]	15.86[a]	31.75[a]	7.59[a]
	(49.16)	(36.56)	(46.56)	(26.49)
101-200% of the FPL (%)	26.96[a]	20.97[ab]	29.16[b]	18.16[ab]
	(44.39)	(40.74)	(45.44)	(38.55)
Above 200% of the FPL (%)	32.27[a]	63.17[a]	39.13[a]	74.25[a]
	(46.77)	(48.27)	(48.82)	(43.73)
Family characteristics				
Parent education	2.53[a]	3.35[a]	2.40[a]	3.27[a]
	(0.98)	(1.21)	(1.13)	(1.09)
Mother employed full-time (%)	57.84[ab]	49.06[ab]	41.12[a]	42.49[b]
	(49)	(50.02)	(49.22)	(49.44)
Father employed full-time (%)	39.31[ab]	79.97[b]	70.42[ab]	82.54[a]
	(48.86)	(40.05)	(45.66)	(37.96)
Family structure (% two-parent)	35.72[a]	85.35[a]	72.06[a]	78.77[a]
	(47.93)	(35.39)	(44.89)	(40.90)
Cognitive achievement				
Math achievement: first grade	47.52[a]	56.46[a]	50.47[a]	59.03[a]
	(13.37)	(15.93)	(14.23)	(15.56)
Reading achievement: first grade	61.92[a]	74.95[a]	63.91[a]	72.12[a]
	(18.98)	(21.50)	(18.83)	(19.83)
Math achievement: third grade	74.31[a]	87.97[a]	80.67[a]	89.98[a]
	(17.37)	(17.79)	(17.15)	(15.81)
Reading achievement: third grade	98.55[a]	110.35[a]	101.81[a]	113.91[a]
	(19.77)	(18.00)	(20.06)	(17.55)
Parental involvement at home				
Building	2.33	2.40[a]	2.27[ab]	2.38[b]
	(0.99)	(0.91)	(0.95)	(0.88)
Games/puzzles	2.81[a]	2.78[b]	2.70[abc]	2.81[c]
	(0.89)	(0.86)	(0.91)	(0.77)
Nature/science	2.05[a]	2.17[ab]	2.07[b]	2.30[ab]
	(0.91)	(0.86)	(0.90)	(0.84)
Reading	3.19[a]	3.20[b]	3.01[abc]	3.16[c]
	(0.74)	(0.71)	(0.79)	(0.69)
Parental involvement at school	3.20[a]	3.63[a]	3.46[a]	4.25[a]
	(1.74)	(1.69)	(1.66)	(1.46)
n	1506	744	1707	6994

Note. Means with the same superscript within each row are significantly different at $\alpha = .05$, as determined by Duncan's Multiple Range Test. Scores on the math assessment range from 9 to 107 for first grade and 32 to 107 for third grade. Scores on the reading assessment range from 17 to 142 for first grade and 42 to 149 for third grade. The parental involvement at home variables range from 1 to 4, and parental involvement at school ranges from 1 to 7, with higher scores indicating higher levels of involvement.

American children scoring higher on first grade reading achievement than European American children. For the measure of parental involvement in the home context, Asian American and European American parents were more likely to engage their children in building activities than Latino/a parents. African American parents were as likely as parents from any of the other groups to work on building activities with their children. African American, Asian American, and European American parents were equally likely to work on games/puzzles or reading activities with their children and more likely to do so than Latino/a parents. European American parents were the most likely to engage their children in nature/science activities, followed by Asian American parents. Latino/a and African American parents were the least likely to report working on these activities with their children. Significant differences were also found among the four racial/ethnic groups on parental involvement at school. European American parents were the most likely to be involved in their children's school followed by Asian American, Latino/a, and then African American parents.

MULTILEVEL ANALYSES

AFRICAN AMERICAN FAMILIES. Following the analyses steps described in the previous chapter, I first investigated whether the negative association between family poverty and parental involvement in education was statistically significant for each of the parental involvement variables in African American families. In Table 9, family poverty was negatively related to nature/science activities for poor families ($b = -0.24$, $p < .01$) net of the full set of individual- and school-level control variables. Family poverty was also negatively associated with parental involvement at school for families living in poor

(b = -0.53, p < .001) and low-income homes (b = -0.29, p < .05) after accounting for the control variables (see Table 10). In line with the findings for the full sample, family poverty was not associated with building (b = -0.12, p = .16), games/puzzles (b = 0.01, p = .93), or reading activities (b = -0.02, p = .75).

Table 9. Results of Multilevel Models Predicting Nature/Science for African American Families

Measure	Model 1	Model 2	Model 3
Family economic status			
100% or below the FPL	-0.19**	-0.20**	-0.24**
101-200% of the FPL	-0.04	-0.04	-0.04
Family characteristics			
Parent education		0.10***	0.10**
Mother employed full-time		-0.14*	-0.16**
Mother employed part-time		-0.08	-0.08
Father employed full-time		-0.31**	-0.31**
Father employed part-time		-0.06	-0.07
Family structure (two-parent)		-0.0005	0.00
Individual-level control variables			
Age (years)			0.02
Gender (female)			-0.05
Year in kindergarten (first)			0.04
Pre-K relative care			-0.02
Pre-K non-relative care			0.04
Center-care enrollment			0.00
Head Start enrollment			-0.04
Other type of child care			0.18+
Timing of assessment (days from start)			0.00
School-level control variables			
Sector (private)			0.05
School size			-0.04
School socioeconomic status			0.19
Receipt of Title I funding			0.01
School region: Midwest			-0.08
School region: Northeast			-0.13
School region: West			-0.05
School urbanicity: central city			0.05
School urbanicity: fringe/large town			-0.03

Note. Unstandardized b coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. n = 1,506 (all models). + p < .10, * p < .05, ** p < .01, *** p < .001.

Table 10. Results of Multilevel Models Predicting Parental Involvement at School for African American Families

Measure	Model 1	Model 2	Model 3
Family economic status			
100% or below the FPL	-1.08***	-0.66***	-0.53***
101-200% of the FPL	-0.60***	-0.35**	-0.29*
Family characteristics			
Parent education		0.34***	0.32***
Mother employed full-time		-0.05	-0.13
Mother employed part-time		0.08	0.03
Father employed full-time		-0.16	-0.12
Father employed part-time		0.04	0.03
Family structure (two-parent)		0.59***	0.57***
Individual-level control variables			
Age (years)			-0.08
Gender (female)			-0.06
Year in kindergarten (first)			0.10
Pre-K relative care			0.25
Pre-K non-relative care			0.22
Center-care enrollment			0.15
Head Start enrollment			-0.13
Other type of child care			-0.01
Timing of assessment (days from start)			-0.01*
School-level control variables			
Sector (private)			0.28
School size			-0.02
School socioeconomic status			-0.63+
Receipt of Title I funding			0.27
School region: Midwest			0.10
School region: Northeast			-0.28
School region: West			-0.16
School urbanicity: central city			0.29
School urbanicity: fringe/large town			0.42+

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. n = 1,506 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Having established that the negative correlation between family poverty and parental involvement was statistically significant for nature/science activities and involvement at school, my second step was to examine the association between family poverty and children's first grade math achievement for African American families. In Table 11, poor (b = -6.39, $p < .001$) and low-income African American children

Table 11. Results of Multilevel Models Predicting First Grade Math Achievement for African American Families

Measure	Model 1	Model 2	Model 3	Model 4	Model 5
Family economic status					
100% or below the FPL	-6.39***	-4.01***	-2.73**	-2.26*	-2.33*
101-200% of the FPL	-2.60**	-1.17	-0.15	0.08	0.06
Family characteristics					
Parent education		2.40***	1.92***	1.66***	1.69***
Mother employed full-time		1.29	0.76	0.92	0.86
Mother employed part-time		1.66	1.06	1.11	1.04
Father employed full-time		3.14*	2.39	2.63+	2.50
Father employed part-time		6.31*	5.77+	5.79+	5.76+
Family structure (two-parent)		0.52	0.19	-0.19	-0.20
Individual-level control variables					
Age (years)			6.95***	7.03***	7.02***
Gender (female)			0.43	0.47	0.46
Year in kindergarten (first)			2.60+	2.49	2.55+
Pre-K relative care			0.48	0.31	0.28
Pre-K non-relative care			2.25	2.02	2.04
Center-care enrollment			2.90*	2.77*	2.74*
Head Start enrollment			-0.48	-0.38	-0.40
Other type of child care			-0.48	-0.58	-0.50
Timing of assessment (days from start)			0.05*	0.05*	0.05*
School-level control variables					
Sector (private)			2.22	1.90	1.96
School size			0.08	0.08	0.08
School socioeconomic status			-4.00+	-3.62	-3.50
Receipt of title I funding			-1.14	-1.32	-1.33
School region: Midwest			1.26	1.18	1.15
School region: Northeast			-2.27+	-1.96+	-2.01+
School region: West			2.75+	2.89*	2.87*
School urbanicity: central city			0.70	0.48	0.47
School urbanicity: fringe/large town			2.03	1.67	1.66
Nature/science activities				0.44	
Parental involvement in school				0.73***	0.76***
Level 1 variance	144.80	142.59	136.82	135.71	135.46

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. Level 1 variance for the unconditional model was 145.67. n = 1,506 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

(b = -2.60, $p < .001$) had significantly lower levels of math achievement in first grade than their more affluent peers. This inverse association, however, was reduced to non-significance for low-income families after adding the family characteristics. In Model 3, living in a poor home continued to be negatively correlated with first grade math net of

the full set of individual- and school-level control variables (b = -2.73, p < .01). Adding nature/science and parental involvement at school in Model 4 revealed that nature/science activities were not related to first grade math achievement for African American children. This variable, therefore, was removed from the final model.

In Model 5, parental involvement at school and first grade math were significantly related for African American children (b = 0.76, p < .001), and including this variable reduced the poverty coefficient for poor families. My final step, therefore, tested the statistical significance of the indirect effect. Parental involvement in education significantly mediated the association between family poverty and children's first grade math achievement for poor African American families (z = -2.47, p < .05).

For each of the three remaining achievement outcomes, neither nature/science activities nor parental involvement at school were significantly related to achievement. These findings suggest that parental involvement in education does not explain the negative effect of family poverty on children's first grade reading and third grade math and reading achievement in African American families.

ASIAN AMERICAN FAMILIES. In Tables 12 and 13, family poverty was negatively related to nature/science activities for low-income families (b = -0.20, p < .05) and negatively related to parental involvement at school for families living in poor (b = -0.67, p < .01) and low-income homes (b = -0.44, p < .01) net of the control variables. As before, family poverty was not correlated with building (b = -0.13, p = .24), games/puzzles (b = -0.02, p = .83), or reading activities (b = 0.08, p = .40). My next steps, therefore, investigated whether nature/science activities and involvement at school

Table 12. Results of Multilevel Models Predicting Nature/Science for Asian American Families

Measure	Model 1	Model 2	Model 3
Family economic status			
100% or below the FPL	-0.21*	-0.19+	-0.20+
101-200% of the FPL	-0.24**	-0.19*	-0.20*
Family characteristics			
Parent education		0.07*	0.08*
Mother employed full-time		-0.04	0.00
Mother employed part-time		0.19*	0.23*
Father employed full-time		-0.19	-0.19
Father employed part-time		-0.44*	-0.43*
Family structure (two-parent)		0.11	0.12
Individual-level control variables			
Age (years)			-0.03
Gender (female)			-0.02
Year in kindergarten (first)			0.30
Pre-K relative care			-0.18+
Pre-K non-relative care			-0.06
Center-care enrollment			-0.09
Head Start enrollment			-0.03
Other type of child care			-0.25
Timing of assessment (days from start)			-0.00
School-level control variables			
Sector (private)			0.16
School size			0.04
School socioeconomic status			0.18
Receipt of Title I funding			0.10
School region: Midwest			-0.13
School region: Northeast			-0.05
School region: West			-0.10
School urbanicity: central city			-0.35
School urbanicity: fringe/large town			-0.25

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. $n = 744$ (all models). + $p < .10$, * $p < .05$, ** $p < .01$.

Table 13. Results of Multilevel Models Predicting Parental Involvement at School for Asian American Families

Measure	Model 1	Model 2	Model 3
Family economic status			
100% or below the FPL	-1.16***	-0.80***	-0.67**
101-200% of the FPL	-0.78***	-0.52**	-0.44**
Family characteristics			
Parent education		0.26***	0.24***
Mother employed full-time		-0.03	-0.06
Mother employed part-time		0.63***	0.60***
Father employed full-time		-0.41	-0.37
Father employed part-time		-0.40	-0.30
Family structure (two-parent)		0.23	0.05
Individual-level control variables			
Age (years)			0.16
Gender (female)			0.22+
Year in kindergarten (first)			-0.62+
Pre-K relative care			0.01
Pre-K non-relative care			-0.14
Center-care enrollment			0.12
Head Start enrollment			0.36
Other type of child care			0.07
Timing of assessment (days from start)			-0.00
School-level control variables			
Sector (private)			0.47*
School size			0.01
School socioeconomic status			-1.02+
Receipt of Title I funding			0.30+
School region: Midwest			0.42+
School region: Northeast			0.23
School region: West			0.41*
School urbanicity: central city			0.14
School urbanicity: fringe/large town			0.27

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. $n = 744$ (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

served to mediate the association between family poverty and children's academic achievement for each of the four outcome variables. I found that none of the proposed mediational models met the three remaining conditions for mediation. The results of models predicting Asian American children's first grade achievement indicated that nature/science activities and parental involvement at school were not significantly related to math or reading for first grade Asian American children. As seen in Table 14, nature/science activities was not associated with third grade math, and although parental involvement at school was correlated with third grade math, the association was negative (b = -0.61, $p < .05$). In Table 15, the results for children's third grade reading achievement suggest that nature/science activities were not related to third grade reading. In the final model, parental involvement at school was positively related to third grade reading (b = 0.87, $p < .01$), and adding this variable reduced the poverty coefficient for low-income families. Testing the significance of the indirect effect, however, revealed that the relation between family poverty and third grade reading was not significantly mediated by parental involvement at school. Taken together, the findings for Asian American families suggest that parental involvement in education is not a significant mediator of the association between family poverty and children's first and third grade achievement for this racial/ethnic group.

Table 14. Results of Multilevel Models Predicting Third Grade Math Achievement for Asian American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-0.14	1.77	1.66	1.20
101-200% of the FPL	-2.79*	-1.91	-1.80	-2.08+
Family characteristics				
Parent education		1.92***	1.61***	1.74***
Mother employed full-time		0.07	0.23	0.12
Mother employed part-time		-2.56*	-2.43+	-2.17+
Father employed full-time		-0.84	-1.65	-1.88
Father employed part-time		-0.37	-1.04	-1.28
Family structure (two-parent)		-3.84+	-3.82	-3.95+
Individual-level control variables				
First grade math achievement	0.84***	0.81***	0.79***	0.80***
Age (years)			-2.38+	-2.32+
Gender (female)			-1.95*	-1.82*
Year in kindergarten (first)			9.16***	8.83***
Pre-K relative care			-2.55+	-2.59+
Pre-K non-relative care			4.27+	4.12+
Center-care enrollment			1.49	1.47
Head Start enrollment			1.54	1.75
Other type of child care			2.06	2.05
Timing of assessment (days from start)			-0.03	-0.03
School-level control variables				
Sector (private)			-1.42	-1.12
School size			0.86+	0.88+
School socioeconomic status			-4.41	-4.99
Receipt of title I funding			-1.83	-1.57
School region: Midwest			3.40+	3.72*
School region: Northeast			3.99*	4.27*
School region: West			2.10	2.46+
School urbanicity: central city			-0.72	-0.64
School urbanicity: fringe/large town			-2.04	-1.91
Nature/science activities				-0.07
Parental involvement at school				-0.61*

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. $n = 744$ (all models). + $p < .10$, * $p < .05$, ** $p < .01$.

Table 15. Results of Multilevel Models Predicting Third Grade Reading Achievement for Asian American Families

Measure	Model 1	Model 2	Model 3	Model 4	Model 5
Family economic status					
100% or below the FPL	-3.97**	-2.63+	-1.88	-1.10	-1.15
101-200% of the FPL	-5.27***	-4.50***	-3.96**	-3.43**	-3.52**
Family characteristics					
Parent education		1.16*	1.18*	0.97+	1.01*
Mother employed full-time		-1.62	-1.78	-1.60	-1.59
Mother employed part-time		-1.46	-2.09	-2.60+	-2.44+
Father employed full-time		1.52	0.44	0.78	0.79
Father employed part-time		0.50	-0.19	0.29	0.17
Family structure (two-parent)		2.88	1.59	1.56	1.71
Individual-level control variables					
First grade reading achievement	0.56***	0.54***	0.53***	0.53***	0.53***
Age (years)			2.83+	2.55+	2.52+
Gender (female)			1.67+	1.47	1.49
Year in kindergarten (first)			1.30	1.54	1.75
Pre-K relative care			-2.04	-1.98	-2.08
Pre-K non-relative care			-1.63	-1.56	-1.59
Center-care enrollment			-0.30	-0.39	-0.43
Head Start enrollment			-3.02	-3.42	-3.54+
Other type of child care			3.69	3.63	3.50
Timing of assessment (days from start)			-0.06	-0.05	-0.06
School-level control variables					
Sector (private)			-1.78	-2.28	-2.20
School size			-0.48	-0.51	-0.49
School socioeconomic status			-7.21	-6.39	-6.19
Receipt of title I funding			0.25	-0.14	-0.10
School region: Midwest			1.71	1.36	1.33
School region: Northeast			1.76	1.37	1.45
School region: West			-1.97	-2.40	-2.40
School urbanicity: central city			-3.72*	-3.66*	-3.86*
School urbanicity: fringe/large town			-2.44	-2.56	-2.69
Nature/science activities				0.58	
Parental involvement at school				0.84**	0.87**

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummyvariables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. $n = 744$ (all models).

LATINO/A FAMILIES. In Table 16, family poverty was negatively related to reading activities for poor ($b = -0.12$, $p < .05$) and low-income Latino/a families ($b = -0.11$, $p < .05$) after controlling for the full set of control variables. As seen in Table 17, after adding the control variables, poor ($b = -0.62$, $p < .001$) and low-income parents ($b =$

-0.32, $p < .01$) were also less likely to be involved in their children's school than more affluent parents in this racial/ethnic group. Poor, low-income, and non-poor parents, however, were equally likely to engage their children in building ($b = -0.05$, $p = .47$), games/puzzles ($b = -0.07$, $p = .29$), or nature/science activities ($b = -0.11$, $p = .10$).

Next, I investigated whether reading activities and parental involvement at school mediated the association between family poverty and children's math and reading achievement in first and third grade. My results suggested that these parental involvement variables did not explain the negative impact of poverty on children's early academic achievement in Latino/a families. In Table 18, the negative association between family poverty and children's first grade math was statistically significant for poor ($b = -5.72$, $p < .001$) and low-income children ($b = -3.70$, $p < .001$). Adding the full set of control variables in Model 3, however, reduced this association to non-significance for both income groups. The results of models predicting children's first grade reading achievement revealed that reading activities and parental involvement at school were not related to first grade reading. These parental involvement variables were also not associated with children's third grade math or reading achievement in Latino/a families.

Table 16. Results of Multilevel Models Predicting Reading Activities for Latino/a Families

Measure	Model 1	Model 2	Model 3
Family economic status			
100% or below the FPL	-0.29***	-0.18**	-0.12*
101-200% of the FPL	-0.21***	-0.14**	-0.11*
Family characteristics			
Parent education		0.10***	0.08***
Mother employed full-time		-0.04	-0.03
Mother employed part-time		-0.06	-0.06
Father employed full-time		0.12	0.11
Father employed part-time		0.12	0.18
Family structure (two-parent)		0.14*	0.17**
Individual-level control variables			
Age (years)			-0.13*
Gender (female)			0.30***
Year in kindergarten (first)			-0.12
Pre-K relative care			-0.05
Pre-K non-relative care			-0.08
Center-care enrollment			0.12*
Head Start enrollment			-0.10
Other type of child care			0.06
Assessment language status (Spanish)			-0.19***
Timing of assessment (days from start)			0.00
School-level control variables			
Sector (private)			-0.14
School size			0.02
School socioeconomic status			-0.25+
Receipt of Title I funding			0.07
School region: Midwest			-0.01
School region: Northeast			-0.03
School region: West			-0.03
School urbanicity: central city			0.02
School urbanicity: fringe/large town			-0.03

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. n = 1,707 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 17. Results of Multilevel Models Predicting Parental Involvement at School for Latino/a Families

Measure	Model 1	Model 2	Model 3
Family economic status			
100% or below the FPL	-1.10***	-0.78***	-0.62***
101-200% of the FPL	-0.63***	-0.44***	-0.32**
Family characteristics			
Parent education		0.34***	0.30***
Mother employed full-time		-0.24**	-0.31***
Mother employed part-time		-0.01	-0.06
Father employed full-time		0.07	0.05
Father employed part-time		0.04	0.07
Family structure (two-parent)		0.11	0.11
Individual-level control variables			
Age (years)			-0.01
Gender (female)			0.21**
Year in kindergarten (first)			0.32
Pre-K relative care			0.10
Pre-K non-relative care			0.20
Center-care enrollment			0.11
Head Start enrollment			-0.01
Other type of child care			0.12
Assessment language status (Spanish)			-0.13
Timing of assessment (days from start)			0.01*
School-level control variables			
Sector (private)			0.30
School size			-0.06
School socioeconomic status			-1.07***
Receipt of Title I funding			0.25*
School region: Midwest			-0.08
School region: Northeast			-0.69***
School region: West			0.15
School urbanicity: central city			0.05
School urbanicity: fringe/large town			0.11

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. n = 1,707 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 18. Results of Multilevel Models Predicting First Grade Math Achievement for Latino/a Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-5.72***	-2.86**	-0.31	0.13
101-200% of the FPL	-3.70***	-1.84*	-0.16	0.04
Family characteristics				
Parent education		3.12***	2.07***	1.92***
Mother employed full-time		-0.89	-1.35+	-1.27
Mother employed part-time		-0.29	-0.94	-1.03
Father employed full-time		1.53	1.02	1.00
Father employed part-time		-1.86	-2.06	-2.12
Family structure (two-parent)		-0.12	-0.17	-0.02
Individual-level control variables				
Age (years)			6.49***	6.40***
Gender (female)			-0.30	-0.43
Year in kindergarten (first)			4.15*	3.83*
Pre-K relative care			0.59	0.44
Pre-K non-relative care			0.83	0.64
Center-care enrollment			0.32	0.24
Head Start enrollment			-2.20*	-2.38*
Other type of child care			1.51	1.43
Assessment language status (Spanish)			-6.63***	-6.52***
Timing of assessment (days from start)			0.06*	0.06*
School-level control variables				
Sector (private)			1.83	1.67
School size			1.63***	1.64***
School socioeconomic status			3.92***	3.73**
Receipt of title I funding			-1.37	-1.45
School region: Midwest			-2.21	
School region: Northeast			-6.33***	-5.98***
School region: West			-2.80**	-2.93**
School urbanicity: central city			-0.03	0.02
School urbanicity: fringe/large town			-0.08	-0.12
Parental involvement at home				
Building activities				-0.36
Games/puzzles				-0.29
Nature/science activities				0.73+
Frequency of reading				-0.23
Parental involvement at school				0.52*

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. n = 1,707 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

EUROPEAN AMERICAN FAMILIES. Consistent with the findings for the full sample, in Table 19, poor (b = -0.70, $p < .001$) and low-income European American parents (b = -0.24, $p < .001$) were less involved in their children's education at school

(see Table 19), but not at home. My next steps, therefore, assessed whether parental involvement at school mediated the association between family poverty and children's first and third grade achievement.

Beginning with first grade achievement, Table 20 presents the results of multilevel models predicting first grade math for European American children. The inverse association between family poverty and first grade math was statistically significant for poor (b = -4.63, p < .001) and low-income children (b = -2.22, p < .001) after accounting for the full set of individual- and school-level control variables. In the final model, parental involvement at school was significantly related to first grade math (b = 0.90, p < .001), and adding this variable in the model reduced the poverty coefficient for both income groups. Testing for the significance of the indirect effect revealed that parental involvement at school significantly mediated the association between family poverty and children's first grade math achievement in poor (z = -5.70, p < .001) and low-income European American families (z = -4.16, p < .001).

In Table 21, the inverse association between family poverty and first grade reading was statistically significant for poor (b = -5.95, p < .001) and low-income European American children (b = -2.23, p < .001) after adding the individual- and school-level control variables. Adding the parental involvement variables in Model 4 reduced the poverty coefficient for both income groups. In line with the findings for math, parental involvement at school was significantly correlated with children's first grade reading achievement (b = 0.92, p < .001) and significantly mediated the association between family poverty and first grade reading for poor (z = -4.81, p < .001) and low-income European American families (z = -3.77, p < .001).

Table 19. Results of Multilevel Models Predicting Parental Involvement at School for European American Families

Measure	Model 1	Model 2	Model 3
Family economic status			
100% or below the FPL	-1.20***	-0.80***	-0.70***
101-200% of the FPL	-0.52***	-0.28***	-0.24***
Family characteristics			
Parent education		0.29***	0.27***
Mother employed full-time		-0.24***	-0.26***
Mother employed part-time		0.17***	0.16***
Father employed full-time		0.42***	0.39***
Father employed part-time		0.12	0.11
Family structure (two-parent)		0.36***	0.34***
Individual-level control variables			
Age (years)			0.08+
Gender (female)			0.02
Year in kindergarten (first)			0.05
Pre-K relative care			0.04
Pre-K non-relative care			0.09
Center-care enrollment			0.14**
Head Start enrollment			-0.11
Other type of child care			0.12
Timing of assessment (days from start)			-0.01***
School-level control variables			
Sector (private)			0.03
School size			-0.05*
School socioeconomic status			-1.16***
Receipt of Title I funding			0.14*
School region: Midwest			-0.15*
School region: Northeast			-0.21**
School region: West			0.09
School urbanicity: central city			0.21**
School urbanicity: fringe/large town			0.24***

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. n = 6,994 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 20. Results of Multilevel Models Predicting First Grade Math Achievement for European American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-8.90***	-5.14***	-4.63***	-3.99***
101-200% of the FPL	-5.11***	-2.36***	-2.22***	-2.00***
Family characteristics				
Parent education		3.68***	3.45***	3.21***
Mother employed full-time		-0.48	-0.27	-0.04
Mother employed part-time		0.73	0.93+	0.78
Father employed full-time		1.19	1.23	0.88
Father employed part-time		2.92+	2.59+	2.49+
Family structure (two-parent)		1.97**	1.89**	1.57*
Individual-level control variables				
Age (years)			8.35***	8.28***
Gender (female)			-1.30***	-1.32
Year in kindergarten (first)			5.01***	4.96***
Pre-K relative care			-0.28	-0.32
Pre-K non-relative care			0.55	0.99+
Center-care enrollment			0.83	1.05**
Head Start enrollment			-1.63+	-1.91***
Other type of child care			-1.35	-0.72
Timing of assessment (days from start)			0.06***	0.05***
School-level control variables				
Sector (private)			0.65	0.85
School size			0.31	0.47*
School socioeconomic status			-3.94+	-3.08*
Receipt of title I funding			-0.14	-0.65
School region: Midwest			-1.04	-0.80
School region: Northeast			-2.82***	-2.73***
School region: West			-1.13	-1.14*
School urbanicity: central city			1.13	1.28*
School urbanicity: fringe/large town			0.68	1.13*
Parental involvement at school				0.90***
Level 1 variance	209.15	199.10	192.78	191.72

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. Level 1 variance for the unconditional model was 214.03. n = 6,994 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, ***$p < .001$.

Table 21. Results of Multilevel Models Predicting First Grade Reading Achievement for European American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-10.56***	-7.32***	-5.95***	-5.30***
101-200% of the FPL	-5.50***	-3.04***	-2.23***	-2.02***
Family characteristics				
Parent education		3.87***	3.42***	3.18***
Mother employed full-time		-2.17***	-2.05***	-1.81**
Mother employed part-time		0.12	0.17	0.01
Father employed full-time		1.14	1.44	1.08**
Father employed part-time		4.18*	4.52*	4.41*
Family structure (two-parent)		2.56**	2.43**	2.11**
Individual-level control variables				
Age (years)			7.74***	7.67***
Gender (female)			3.61***	3.59***
Year in kindergarten (first)			7.98***	7.94***
Pre-K relative care			0.43	0.39
Pre-K non-relative care			0.62	0.54
Center-care enrollment			0.92	0.79
Head Start enrollment			-2.35*	-2.25+
Other type of child care			-0.89	-1.01
Timing of assessment (days from start)			0.09***	0.09***
School-level control variables				
Sector (private)			0.91	0.87
School size			0.03	0.08
School socioeconomic status			-12.18***	-11.15***
Receipt of title I funding			-1.37+	-1.50*
School region: Midwest			-2.37**	-2.23*
School region: Northeast			-3.39	-3.19**
School region: West			-1.04	-1.11
School urbanicity: central city			2.42*	2.22*
School urbanicity: fringe/large town			0.93	0.72
Parental involvement at school				0.92***
Level 1 variance	322.45	311.99	304.14	303.35

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. Level 1 variance for the unconditional model was 328.17. n = 6,994 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, ***$p < .001$.

Turning to third grade achievement, I found that parental involvement at school was not significantly related to third grade math. This finding suggests that parental involvement in education (whether in the home or school context) does not explain the

association between poverty and children's third grade math achievement in European American families.

Table 22 presents the results of multilevel models predicting children's third grade reading achievement. Poverty was negatively correlated with third grade reading net of the control variables for poor (b = -2.88, p < .001) and low-income European American children (b = -1.11, p < .05). In Model 4, the association between parental involvement at school and third grade reading was statistically significant (b = 0.28, p < .05), and adding parental involvement at school reduced the poverty coefficient from the previous model for poor and low-income families. In line with the findings for the first grade reading achievement of European American children, parental involvement at school significantly mediated the association between family poverty and third grade reading for European American children living in poor (z = -2.14, p < .05) and low-income homes (z = -2.02, p < .05).

In summary, I investigated the mediational model of family poverty, parental involvement at school, and children's early academic achievement for African American, Asian American, Latino/a, and European American families. I found that parental involvement in the home context was not a significant mediator of the association between family poverty and children's achievement for any of the families in this study regardless of their racial/ethnic background. Parental involvement at school, however, significantly mediated the link between family poverty and children's first grade math achievement for African American families. Involvement at school also explained the association between family poverty and children's math and reading achievement in first grade and children's reading achievement in third grade for European American families.

The conceptual model did not hold for Asian American or Latino/a families. In other words, parental involvement in education (whether at home or at school) was not a significant mediator for these two racial/ethnic groups.

Table 22. Results of Multilevel Models Predicting Third Grade Reading Achievement for European American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL	-6.08***	-3.83***	-2.88***	-2.71***
101-200% of the FPL	-3.33***	-1.64***	-1.11*	-1.04*
Family characteristics				
Parent education		2.23***	2.03***	1.97***
Mother employed full-time		0.33	0.11	0.18
Mother employed part-time		0.38	0.26	0.21
Father employed full-time		0.58	0.37	0.26
Father employed part-time		0.68	0.84	0.83
Family structure (two-parent)		0.55	0.37	0.28
Individual-level control variables				
First grade reading achievement	0.60***	0.58***	0.57***	0.57***
Age (years)			1.05*	1.04*
Gender (female)			1.33***	1.33***
Year in kindergarten (first)			3.49***	3.46***
Pre-K relative care			-0.73	-0.74
Pre-K non-relative care			1.91**	1.87**
Center-care enrollment			0.41	0.37
Head Start enrollment			-3.17***	-3.14***
Other type of child care			0.05	0.02
Timing of assessment (days from start)			-0.05***	-0.04***
School-level control variables				
Sector (private)			-0.65	-0.66
School size			0.17	0.18
School socioeconomic status			-3.86+	-3.58+
Receipt of title I funding			-0.51	-0.55
School region: Midwest			0.46	0.50
School region: Northeast			0.03	0.08
School region: West			0.65	0.63
School urbanicity: central city			0.22	0.15
School urbanicity: fringe/large town			0.01	-0.06
Parental involvement at school				0.28*
Level 1 variance	152.08	148.66	148.06	147.94

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables; mother/father not employed was the reference category for mother/father employment status; no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment; South was the reference category for school region; small town/rural was the reference category for school urbanicity. Level 1 variance for the unconditional model was 154.16. n = 6,994 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, ***$p < .001$.

Chapter 5

Study Three: An Investigation of Resilience in Economically Disadvantaged Families

In the family process model of this dissertation, family poverty affects parental involvement in education which, in turn, affects achievement during the transition to elementary school. Focusing on the association between poverty and parental involvement, then, is important for understanding how to reduce the educational risk associated with living in poverty. The goal of the third study, therefore, is to investigate parent and child characteristics that promote resilience (or better than expected outcomes) in economically disadvantaged families. Specifically, I examine characteristics that potentially reduce the negative effects of poverty on parental involvement in education.

In general, economically disadvantaged parents are less involved in their children's education than more affluent parents (Heymann, 2000). Differences in parental involvement, however, exist among economically disadvantaged families and are likely related to both parent and child factors. By identifying the characteristics of involved parents and their children, this study sheds light on how schools and programs can improve the educational chances of economically disadvantaged children.

PARENTAL CHARACTERISTICS

To investigate whether the association between poverty and parental involvement in education varies across economically disadvantaged families, I first examine parents' psychological well-being. As discussed, poverty is a highly disorienting and upsetting experience. The stress, frustration, and loss of control associated with financial problems

threaten the psychological well-being of economically disadvantaged parents (McLoyd, 1990). Specifically, past research suggests that the stresses related to inadequate financial resources predict parental depression (Brody et al., 1994; Mistry et al., 2002; Yeung, Linver, & Brooks-Gunn, 2002) which, in turn, negatively affects parents' ability to provide warm, responsive parenting (Smith et al., 1997). Parental depression may also influence parental involvement in education by, for example, reducing parents' motivation to become and stay involved in their children's educational lives.

For a variety of reasons, however, some economically disadvantaged parents may maintain psychological health despite the multiple stressors associated with living in poverty (Crosnoe et al., 2002). For these parents, poverty may be a less distressing experience and, therefore, their involvement in the schooling process may be less reactive to economic circumstances. If so, then parents' psychological well-being may be a resource that promotes resilience among economically disadvantaged children. To investigate the potential moderating role of parents' psychological well-being, I ask: does parents' psychological well-being moderate the effect of poverty on parental involvement in education? I expect that the negative effect of poverty on parental involvement will be lower among parents who report higher levels of psychological well-being.

A second parental characteristic that I examine relates to the academic expectations of economically disadvantaged parents. Living in poverty not only disrupts the general psychological well-being of parents but it also interferes with the specific beliefs that parents hold about their children. As discussed, economically disadvantaged parents are less optimistic about their children's educational chances than more affluent

parents. Specifically, they see their children as less capable of graduating from high school or attending college compared to more advantaged parents (Crosnoe et al., 2002).

Due to a number of individual, family, and social factors, however, economically disadvantaged parents vary in their academic expectations. For example, parents who receive support from friends and family members may be more likely to hold positive beliefs about their children, despite their economic situation (Taylor, 1994). In these families, optimistic beliefs about children's educational chances may positively influence parental involvement in education. Specifically, if parents have high academic expectations for their children, then they may be more willing to invest in their children's educational careers through their involvement at home and in the school (Eccles & Harold, 1993). High academic expectations, then, may represent a family resource that moderates the association between economic disadvantage and parental involvement in education. I expect that the negative impact of economic disadvantage on involvement will be lower among parents who have higher academic expectations for their children.

Thus, I argue that the association between poverty and parental involvement in education is not monolithic. Instead, it depends on parents' psychological well-being and their academic expectations. The next step is to examine child characteristics that potentially moderate the impact of economic disadvantage on parental involvement.

CHILD CHARACTERISTICS

To investigate child characteristics that protect against the negative effect of poverty on parental involvement in education, I examine children's social competence. Definitions of children's social competence vary greatly (Raver & Zigler, 1997) but

typically incorporate the skills and behaviors of children that lead to positive outcomes in a given setting. Past research has demonstrated that the presence or absence of these skills and behaviors has serious and long-lasting effects on children's development through their influence on school adjustment, academic achievement, mental health, and interpersonal relationships with peers and adults (Kupersmidt, Coie, & Dodge, 1990; McLelland, Morrison, & Holmes, 2000; Shores & Wehby, 1999; Walker, Stieber, & Eisert, 1991). During the transition to elementary school, in particular, social competence may play a key role in children's ability to adapt to and function in a formal school setting (Raver, 2002).

In this study, I focus on two key aspects of children's social competence, behavioral self-regulation and interpersonal skills. First, in the developmental literature, behavioral self-regulation refers to children's ability to control their behavior in response to the expectations and demands of a particular environmental setting (Crosnoe, in press). In school and home settings, children who regulate their behavior follow rules, stay on-task during an activity or assignment, and respond appropriately during conflicts with other children and adults (McClelland et al., 2000). Interpersonal skills, the second aspect of children's social competence, include behaviors such as interacting positively with peers and adults, playing cooperatively with peers, and joining play groups appropriately (McClelland et al., 2000).

Although most economically disadvantaged children do not develop socioemotional problems (Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002), past research has demonstrated that living in poverty, especially persistent poverty, has a significant negative effect on social competence (McLoyd, 1998). The adverse and

stressful life events that often coincide with living in poverty can affect children's social competence directly (Attar, Guerra, & Tolan, 1994) or indirectly through its negative influence on parenting behaviors (Mistry et al., 2002). For economically disadvantaged children who are able to maintain social competence, however, their interpersonal and self-regulatory skills may serve to protect them against the negative impact of poverty on developmental outcomes.

In this study, I expect that social competence, specifically children's interpersonal skills and their ability to regulate their behavior, will reduce the negative effect of poverty on parental involvement in education. The moderating role of social competence may occur for two primary reasons. First, parents may be more willing and better able to work with socially competent children on educational activities in the home. As discussed, self-regulated children are more likely to remain on-task and less likely to argue with their parents (McClelland et al., 2000). For these reasons, parents of self-regulated children may be more motivated to engage in home learning activities such as reading with their children or helping children with homework.

Second, research has demonstrated that children with interpersonal and self-regulatory skills have better relationships with their teachers compared to socially and behaviorally difficult children (Ladd, Birch, & Buhs, 1999). Specifically, socially competent children receive more instruction and more positive feedback from their teachers (Arnold, et al., 1999; McEvoy & Welker, 2000). In addition, socially competent children who are liked by teachers and peers enjoy school and learning more and have better school attendance than less competent children (Berndt & Keefe, 1995; Birch & Ladd, 1997; Murray & Greenberg, 2000). As a result, socially competent children may

be more likely to involve their parents in their educational experience at home and in school. At the same time, teachers of socially competent children may be more likely to elicit parents' involvement if they have a positive relationship with the child and believe that parental involvement is important.

Thus, I expect that social competence will serve as a protective factor, buffering the negative impact of poverty on parental involvement in education. Specifically, I expect that children's ability to regulate their behavior and children's interpersonal skills will moderate the poverty-parental involvement association by reducing the negative effect of poverty on parental involvement.

Method

MEASURES

PARENTS' PSYCHOLOGICAL WELL-BEING. Parents' psychological well-being was assessed using a condensed version of the Center for Epidemiologic Studies-Depression (CES-D; Radloff, 1977) scale in the kindergarten data collection. Parents reported how often (1 = never, 2 = some of the time, 3 = a moderate amount of time, 4 = most of the time) during the past week they experienced eleven depressive symptoms, including loss of appetite, sleeping difficulties, and fearfulness. The mean of the eleven items served as the final scale (α = .85).

PARENTAL ACADEMIC EXPECTATIONS. In the kindergarten data collection, parents were asked how far in school they expected their child to go (1 = receive less than a high school diploma, 2 = graduate from high school, 3 = attend two or more years of

college, 4 = finish a four- or five-year college degree, 5 = earn a master's degree, and 6 = finish a Ph.D., M.D., or other advanced degree).

CHILDREN'S BEHAVIORAL SELF-REGULATION AND INTERPERSONAL SKILLS. ECLS-K adapted items from the Social Skills Rating Scale (Gresham & Elliott, 1990) to assess children's behavioral self-regulation and interpersonal skills. General descriptions of the measures are provided by ECLS-K, but the copyrighted items are not available for review.

Teachers rated on a four-point scale (1 = *never* to 4 = *very often*) children's ability to regulate their behavior. Items assessed how often the child gets angry, argues, or throws tantrums. The mean of the items served as the final scale for children's behavioral self-regulation (α = .80). On the same four-point scale, teachers rated children's interpersonal skills, including their ability to get along with others, express ideas and opinion in positive ways, and show sensitivity to the feelings of others. The mean of the items served as the final scale for children's interpersonal skills (α = .89).

PLAN OF ANALYSIS

Multilevel modeling was used to assess whether the association between family poverty and parental involvement in education varied as a function of parent and child characteristics for all racial/ethnic groups and for each of the four racial/ethnic groups separately. (See Appendix C for a description of the multilevel models.) The analysis proceeded in three general steps. First, for each family poverty variable, the first parental involvement variable, parental involvement at school, was regressed on family poverty. Family structure, parents' educational status, and parents' employment status were then

added to this base model. Next, I included the remaining individual- and school-level control variables to estimate the association between family poverty and parental involvement at school net of the full set of control variables. The final model added interaction terms between each parent or child characteristic and the family poverty variable.

The second step in this analysis was to repeat the previous steps for each of the four parental involvement at home variables. The purpose of this step was to assess whether the parent and child characteristics moderate the association between family poverty and each of the parental involvement at home variables. Third, I assessed the moderating effects of the parent and child characteristics for African American, Asian American, Latino/a, and European American families by employing all of the above steps for each racial/ethnic group separately.

Results

To some extent, family poverty disrupts children's early academic achievement by affecting the involvement of their parents. As discussed, however, not all families respond to poverty in the same way. Some poor families have social and psychological resources that protect against the negative effects of poverty on parental involvement. To examine these protective mechanisms, I focused on the first half of the conceptual model presented in Figure 1 and asked: Do parents' psychological well-being and academic expectations and children's behavioral self-regulation and interpersonal skills moderate the association between family poverty and parental involvement in education? I

expected that the negative effect of poverty on parental involvement in education would be lower for families who reported higher levels of these characteristics.

DESCRIPTIVE ANALYSES BY LEVEL OF POVERTY

I begin by describing differences among poor, low-income, and non-poor families on the parent and child characteristics that are hypothesized to serve as protective mechanisms. In Table 23, the three income groups differed significantly in terms of parents' academic expectations and parental depression. As expected, poor parents reported the lowest expectations and the highest levels of depression followed by low-income and then non-poor parents. Also in line with expectations, poor children, according to their teachers, had significantly lower behavioral self-regulation and interpersonal skills compared to low-income and non-poor children. Teachers rated non-poor children the highest on these measures.

Table 23. Parent and Child Characteristics by Percentage of Federal Poverty Line

	Means (SD)		
	Poor	Low-income	Non-poor
Parent characteristics			
Academic expectations	3.88[a]	3.98[a]	4.19[a]
	(1.31)	(1.19)	(0.95)
Depression	1.60[a]	1.50[a]	1.36[a]
	(0.57)	(0.49)	(0.37)
Child characteristics			
Behavioral self-regulations skills	3.04[a]	3.17[a]	3.27[a]
	(0.65)	(0.63)	(0.60)
Interpersonal skills	2.97[a]	3.12[a]	3.22[a]
	(0.65)	(0.64)	(0.61)
n	1928	2404	6925

Note. Families at or below 100% of the FPL are "poor;" families between 101 and 200% of the FPL are "low-income;" families above 200% of the FPL are "non-poor." Means with the same superscript within each row were significantly different at $\alpha = .05$, as determined by Duncan's Multiple Range Test. Parents' academic expectations range from 1 to 6 with higher scores representing higher expectations. Parental depression ranges from 1 to 4 with higher scores indicating higher levels of depression. Children's behavioral self-regulation and interpersonal skills range from 1 to 4 with higher scores indicating a higher level of skill.

MULTILEVEL ANALYSES

BUILDING ACTIVITIES. Table 24 addresses whether the parent and child characteristics buffer the negative impact of family poverty on the first parental involvement at home variable: building activities. Recall that this item assessed the frequency in which parents engage their children in building activities at home. After controlling for the individual- and school-level factors in Model 3, family poverty was not related to building activities. In Model 4, the interaction term between poverty and children's interpersonal skills was statistically significant for poor families ($b = 0.19$, $p < .01$).

Table 24. Results of Multilevel Models Predicting Building Activities

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.02	0.04	0.04	-0.12
101-200% of the FPL (low-income)	0.04+	0.08***	0.06*	-0.13
Family characteristics				
Parent education		0.04***	0.05***	0.04***
Mother employed full-time		-0.11***	-0.09***	-0.09***
Mother employed part-time		-0.08**	-0.08**	-0.08**
Father employed full-time		0.13**	0.14**	0.16***
Father employed part-time		0.18**	0.18**	0.21**
Family structure (two-parent)		0.13***	0.14***	0.14***
Individual-level control variables				
Age (years)			-0.11***	-0.11***
Gender (female)			-0.39***	-0.40***
African American			-0.04	-0.06*
Asian American			-0.03	-0.05
Latino/a			-0.08**	-0.10***
Other race/ethnicity			0.02	0.01
Year in kindergarten (first)			-0.08+	-0.10*
Pre-K relative care			-0.04	-0.04
Pre-K non-relative care			-0.12***	-0.11**
Center-care enrollment			-0.05+	-0.05+
Head Start enrollment			0.06	0.06
Other type of child care			0.04	0.02
Assessment language status (Spanish)			-0.27***	-0.27***
Timing of assessment (days from start)			-0.00	-0.00
School-level control variables				
Sector (private)			-0.05	-0.05
School size			0.00	0.01
School socioeconomic status			-0.02	0.01
Receipt of Title I funding			0.05*	0.05*

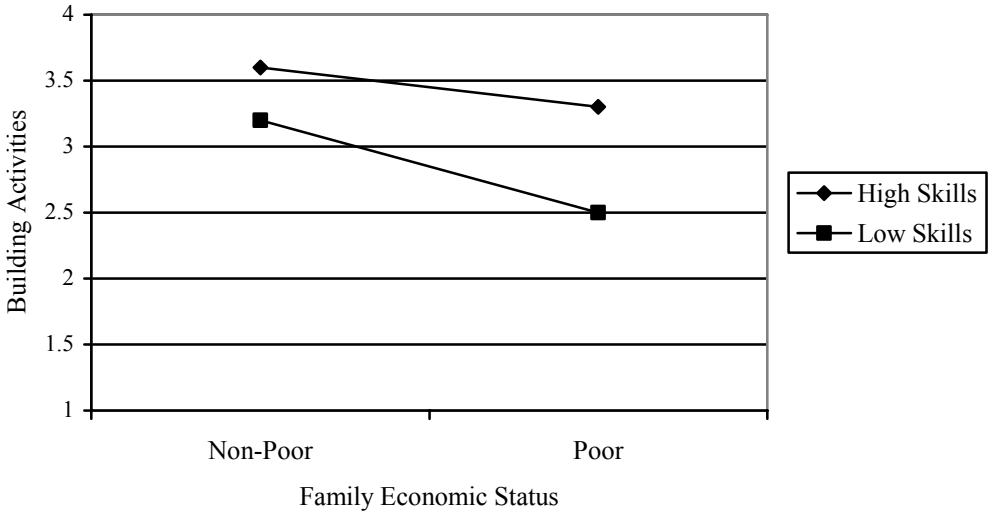
Table 24 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
School region: Midwest			-0.05+	-0.03
School region: Northeast			0.01	0.02
School region: West			0.00	0.01
School urbanicity: central city			-0.00	-0.01
School urbanicity: fringe/large town			-0.04	-0.04
Moderating variables				
Parents' academic expectations				0.06***
Parents' depression				-0.03
Children's behavioral self-regulation				-0.04
Children's interpersonal skills				0.03
Interactions				
Poor x academic expectations				-0.01
Poor x depression				-0.00
Poor x behavioral self-regulation				-0.10+
Poor x interpersonal skills				0.19**
Low-income x academic expectations				-0.02
Low-income x depression				0.08
Low-income x behavioral self-regulation				0.09
Low-income x interpersonal skills				-0.03

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, European American was the reference category for race/ethnicity, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

To interpret this interaction, I calculated predicted levels of building activities for parents whose children scored one standard deviation above and below the mean on interpersonal skills and whose families scored a 0 (above 100% of the FPL) and a 1 (at or below 100% of the FPL) on family poverty. If interpersonal skills moderated the association between family poverty and building activities, as predicted, the negative association between family poverty and building activities would be weaker for children with high levels of interpersonal skills. In other words, as illustrated in Figure 4, the gap between poor and non-poor parents in their rates of building activities would be smaller for children in the sample with high interpersonal skills and larger for children with low interpersonal skills.

Figure 4. An Example of High Interpersonal Skills Reducing the Negative Effect of Poverty on Parental Involvement at School



Contrary to expectations, however, I found that this gap was smaller for children with low interpersonal skills than for children with high interpersonal skills. My next step, therefore, was to investigate whether the significant interaction between family poverty and children's interpersonal skills arose because family poverty moderated the association between children's interpersonal skills and building activities and not because children's interpersonal skills moderated the association between family poverty and family building activities. Interpreting the interaction in this way revealed that the association between children's interpersonal skills and building activities was stronger in poor families than in non-poor families. Children's interpersonal skills were positively related to building activities for all families, but especially for those living in poverty. This finding is consistent with previous research (Cooper & Crosnoe, in press) and

suggests that interpersonal skills do not buffer against the risk of family poverty so much as poverty appears to accentuate the benefits of children's interpersonal skills.

GAMES/PUZZLES ACTIVITIES. Table 25 presents the results of multilevel models predicting games/puzzles activities. In Model 1, family poverty was negatively related to games/puzzles for poor parents (b = -0.06, p < .01) but not for parents living in low-income homes. This inverse association, however, was reduced to non-significance after adding the family characteristics in Model 2. Model 4 indicated that the interaction term between family poverty and parental depression was statistically significant for poor families (b = 0.08, p < .05). In line with the findings for building activities, interpreting the interaction suggested that family poverty moderated the association between parents' depression and games/puzzles activities. As expected, parental depression was negatively related to games/puzzles in non-poor families. In poor families, however, depressed and non-depressed parents were equally likely to engage their children in activities related to games/puzzles.

Table 25. Results of Multilevel Models Predicting Games/Puzzles Activities

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.06**	-0.03	-0.02	-0.07
101-200% of the FPL (low-income)	-0.03	-0.01	-0.00	0.14
Family characteristics				
Parent education		0.05***	0.04***	0.03**
Mother employed full-time		-0.07***	-0.07**	-0.06**
Mother employed part-time		-0.05*	-0.06*	-0.06*
Father employed full-time		-0.03	-0.02	-0.03
Father employed part-time		0.03	0.04	0.02
Family structure (two-parent)		0.06*	0.07*	0.07**
Individual-level control variables				
Age (years)			-0.05*	-0.06*
Gender (female)			-0.06***	-0.07***
African American			0.03	0.01
Asian American			-0.01	-0.00
Latino/a			-0.06*	-0.08**
Other race/ethnicity			0.14*	0.13*
Year in kindergarten (first)			0.01	-0.01
Pre-K relative care			0.05+	0.04
Pre-K non-relative care			-0.07*	-0.06+
Center-care enrollment			-0.02	-0.03
Head Start enrollment			0.05	0.06+
Other type of child care			-0.00	-0.00
Assessment language status (Spanish)			-0.20***	-0.19***
Timing of assessment (days from start)			0.00	0.00
School-level control variables				
Sector (private)			-0.01	0.01
School size			0.00	0.00
School socioeconomic status			-0.08	-0.05
Receipt of Title I funding			0.01	-0.00
School region: Midwest			-0.02	-0.01
School region: Northeast			0.02	0.02
School region: West			-0.03	-0.03
School urbanicity: central city			0.02	0.00
School urbanicity: fringe/large town			0.04	0.04
Moderating variables				
Parents' academic expectations				0.03**
Parents' depression				-0.01
Children's behavioral self-regulation				-0.04
Children's interpersonal skills				0.10***
Interactions				
Poor x academic expectations				0.02
Poor x depression				0.08*
Poor x behavioral self-regulation				-0.09+
Poor x interpersonal skills				0.05
Low-income x academic expectations				0.01
Low-income x depression				-0.06

Table 25 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				0.05
Low-income x interpersonal skills				-0.08

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, European American was the reference category for race/ethnicity, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

NATURE/SCIENCE ACTIVITIES. In Table 26, Model 1 indicated that poor (b = -0.19, $p < .001$) and low-income parents (b = -0.07, $p < .01$) were less likely to engage their children in activities related to nature/science than more affluent parents. In Model 2, the negative association between family poverty and nature/science activities remained statistically significant after including the family characteristics for poor families (b = -0.09, $p < .01$) but not for low-income families. This association, however, was no longer significant after adding the full set of control variables in Model 3. Model 4 indicated that family poverty interacted with children's behavioral self-regulation (b = 0.-13, $p <$ .05) and interpersonal skills (b = 0.12, $p < .05$) in poor families.

Interpreting the interaction between family poverty and children's behavioral self-regulation skills revealed that the strength of the association between self-regulation skills and nature/science activities depended on whether or not the family lived in poverty. Children's behavioral self-regulation skills were negatively related to nature/science activities in poor and non-poor families, but the association was stronger for poor as opposed to non-poor families.

Table 26. Results of Multilevel Models Predicting Nature/Science Activities

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.19***	-0.09**	-0.05	0.08
101-200% of the FPL (low-income)	-0.07**	0.01	0.02	0.18
Family characteristics				
Parent education		0.11***	0.10***	0.08***
Mother employed full-time		-0.08***	-0.07**	-0.07**
Mother employed part-time		-0.02	-0.02	-0.02
Father employed full-time		-0.06	-0.07	-0.08+
Father employed part-time		0.07	0.06	0.06
Family structure (two-parent)		0.07*	0.08*	0.06+
Individual-level control variables				
Age (years)			0.05*	0.05*
Gender (female)			-0.05**	-0.07***
African American			-0.11***	-0.13***
Asian American			-0.11*	-0.13**
Latino/a			-0.09**	-0.12***
Other race/ethnicity			0.24***	0.23***
Year in kindergarten (first)			0.05	0.03
Pre-K relative care			-0.01	-0.02
Pre-K non-relative care			-0.02	-0.03
Center-care enrollment			0.03	0.01
Head Start enrollment			0.02	0.02
Other type of child care			0.04	0.03
Assessment language status (Spanish)			-0.07	-0.09
Timing of assessment (days from start)			0.00	0.00
School-level control variables				
Sector (private)			0.00	0.00
School size			-0.01	-0.01
School socioeconomic status			-0.15*	-0.14+
Receipt of Title I funding			0.05*	0.05*
School region: Midwest			-0.08**	-0.06+
School region: Northeast			-0.09**	-0.07*
School region: West			-0.06*	-0.06+
School urbanicity: central city			-0.06+	-0.07*
School urbanicity: fringe/large town			-0.09**	-0.11***
Moderating variables				
Parents' academic expectations				0.08***
Parents' depression				-0.05+
Children's behavioral self-regulation				-0.03
Children's interpersonal skills				0.07*
Interactions				
Poor x academic expectations				-0.00
Poor x depression				-0.02
Poor x behavioral self-regulation				-0.13*
Poor x interpersonal skills				0.12*
Low-income x academic expectations				-0.03
Low-income x depression				0.05

Table 26 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				0.04
Low-income x interpersonal skills				-0.08

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, European American was the reference category for race/ethnicity, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

I also found that family poverty moderated the association between children's interpersonal skills and nature/science activities. Consistent with the findings for building activities, children's interpersonal skills were positively related to nature/science activities in poor and non-poor families, and an increase in interpersonal skills was associated with a greater increase in nature/science activities for poor families compared to more affluent families.

READING ACTIVITIES. In Table 27, Model 1 indicated that family poverty was negatively associated with reading activities for poor (b = -0.11, $p < .001$) and low-income families (b = -0.05, $p < .01$). This association, however, was reduced to non-significance for both income groups after adding the family characteristics in Model 2. Model 4 revealed significant interactions between family poverty and each of the parent and child characteristics. Interpreting each of the interactions suggested that family poverty, as opposed to the parent or child characteristic, served as the moderating variable.

First, the interaction between family poverty and parents' academic expectations was statistically significant for poor families (b = -0.05, $p < .01$). The positive association between parents' expectations and reading activities was stronger for non-

Table 27. Results of Multilevel Models Predicting Reading Activities

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.11***	-0.00	0.03	-0.03
101-200% of the FPL (low-income)	-0.05**	0.02	0.04*	0.05
Family characteristics				
Parent education		0.08***	0.07***	0.05***
Mother employed full-time		-0.01	-0.02	-0.01
Mother employed part-time		-0.02	-0.03	-0.02
Father employed full-time		0.01	0.03	0.02
Father employed part-time		0.04	0.08	0.10+
Family structure (two-parent)		0.03	0.04	0.03
Individual-level control variables				
Age (years)			-0.09***	-0.09***
Gender (female)			0.32***	0.31***
African American			0.08***	0.07**
Asian American			-0.01	-0.03
Latino/a			-0.06**	-0.09***
Other race/ethnicity			0.01	-0.01
Year in kindergarten (first)			-0.06+	-0.07*
Pre-K relative care			0.00	0.00
Pre-K non-relative care			-0.05+	-0.05
Center-care enrollment			0.05*	0.05*
Head Start enrollment			0.01	0.01
Other type of child care			0.03	0.03
Assessment language status (Spanish)			-0.23***	-0.24***
Timing of assessment (days from start)			0.00	0.00
School-level control variables				
Sector (private)			-0.10***	-0.10***
School size			0.01	0.01
School socioeconomic status			-0.19**	-0.17**
Receipt of Title I funding			0.00	0.01
School region: Midwest			-0.01	0.01
School region: Northeast			0.01	0.01
School region: West			0.02	0.02
School urbanicity: central city			0.03	0.01
School urbanicity: fringe/large town			-0.02	-0.03
Moderating variables				
Parents' academic expectations				0.07***
Parents' depression				-0.04
Children's behavioral self-regulation				-0.00
Children's interpersonal skills				0.03
Interactions				
Poor x academic expectations				-0.05**
Poor x depression				0.09**
Poor x behavioral self-regulation				-0.10*
Poor x interpersonal skills				0.14**
Low-income x academic expectations				-0.01
Low-income x depression				-0.00

Table 27 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				0.06
Low-income x interpersonal skills				-0.05

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, European American was the reference category for race/ethnicity, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

poor families compared to families living in poverty. Second, interpreting the statistically significant interaction for family poverty and parental depression ($b = 0.09$, $p < .01$) suggested that the association between depression and reading activities varied according to the families' economic status. Consistent with the findings for games/puzzles, parental depression was negatively related to reading in non-poor homes but not related to reading in poor homes.

Third, I found that the interaction between family poverty and children's behavioral self regulation skills was statistically significant ($b = -0.10$, $p < .05$). As before, the negative association between behavioral self-regulation and reading activities was stronger for poor families compared to more affluent families. Fourth, in line with the results for nature/science activities, the interaction between family poverty and children's interpersonal skills was statistically significant ($b = 0.14$, $p < .01$), and having high interpersonal skills was more beneficial for poor children than for non-poor children in terms of reading with their parents.

PARENTAL INVOLVEMENT AT SCHOOL. In Table 28, poor ($b = -1.22$, $p < .001$) and low-income parents ($b = -0.59$, $p < .001$) were less likely to be involved in their children's school compared to their more affluent counterparts. Adding the family

Table 28. Results of Multilevel Models Predicting Parental Involvement in School

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-1.22***	-0.83***	-0.66***	-0.97***
101-200% of the FPL (low-income)	-0.59***	-0.36***	-0.27***	-0.24
Family characteristics				
Parent education		0.30***	0.27***	0.25***
Mother employed full-time		-0.21***	-0.23***	-0.25***
Mother employed part-time		0.16***	0.13***	0.12**
Father employed full-time		0.16*	0.14*	0.11
Father employed part-time		-0.01	-0.01	-0.03
Family structure (two-parent)		0.32***	0.34***	0.28***
Individual-level control variables				
Age (years)			0.04	0.01
Gender (female)			0.05+	-0.01
African American			-0.19***	-0.19***
Asian American			-0.60***	-0.61***
Latino/a			-0.20***	-0.23***
Other race/ethnicity			0.03	0.04
Year in kindergarten (first)			0.06	-0.01
Pre-K relative care			0.08	0.11*
Pre-K non-relative care			0.09	0.09
Center-care enrollment			0.14***	0.15***
Head Start enrollment			-0.07	-0.07
Other type of child care			0.12	0.15*
Assessment language status (Spanish)			-0.13	-0.12
Timing of assessment (days from start)			-0.003**	-0.004**
School-level control variables				
Sector (private)			0.14*	0.15*
School size			-0.05*	-0.05*
School socioeconomic status			-0.82***	-0.82***
Receipt of Title I funding			0.15**	0.15**
School region: Midwest			-0.08	-0.06
School region: Northeast			-0.26***	-0.24***
School region: West			0.11+	0.10
School urbanicity: central city			0.15*	0.13*
School urbanicity: fringe/large town			0.22***	0.18**
Moderating variables				
Parents' academic expectations				0.06**
Parents' depression				-0.10*
Children's behavioral self-regulation				-0.01
Children's interpersonal skills				0.24***
Interactions				
Poor x academic expectations				0.09**
Poor x depression				0.13*
Poor x behavioral self-regulation				-0.11
Poor x interpersonal skills				0.05
Low-income x academic expectations				0.01
Low-income x depression				0.15*

Table 28 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				0.01
Low-income x interpersonal skills				-0.10

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, European American was the reference category for race/ethnicity, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 11,257 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

characteristics in Model 2 and the full set of control variables in Model 3 reduced the poverty coefficients, but the association between family poverty and parental involvement at school remained highly statistically significant for poor and low-income families. In Model 4, family poverty interacted with parents' academic expectations (b = 0.09, $p < .01$) and parental depression (b = 0.13, $p < .05$) for poor families.

Consistent with the findings for reading activities, parents' academic expectations were positively related to school involvement for poor and non-poor families. Contrary to previous findings, however, this association was stronger for poor families compared to non-poor families. Interpreting the interaction between family poverty and parental depression suggested that, as before, the association between parental depression and school involvement was negative for non-poor families and positive for poor families.

For the most part, investigating the connections among family poverty, parental involvement in education, and parent/child characteristics revealed a consistent pattern. As seen in Figure 5, I found that depressed parents were less involved than non-depressed parents in non-poor families. In poor families, however, depressed and non-depressed parents reported similar levels of involvement. In Figure 6, poor and non-poor children

Figure 5. Family Poverty as a Moderator of the Association between Parental Depression and Parental Involvement in Education

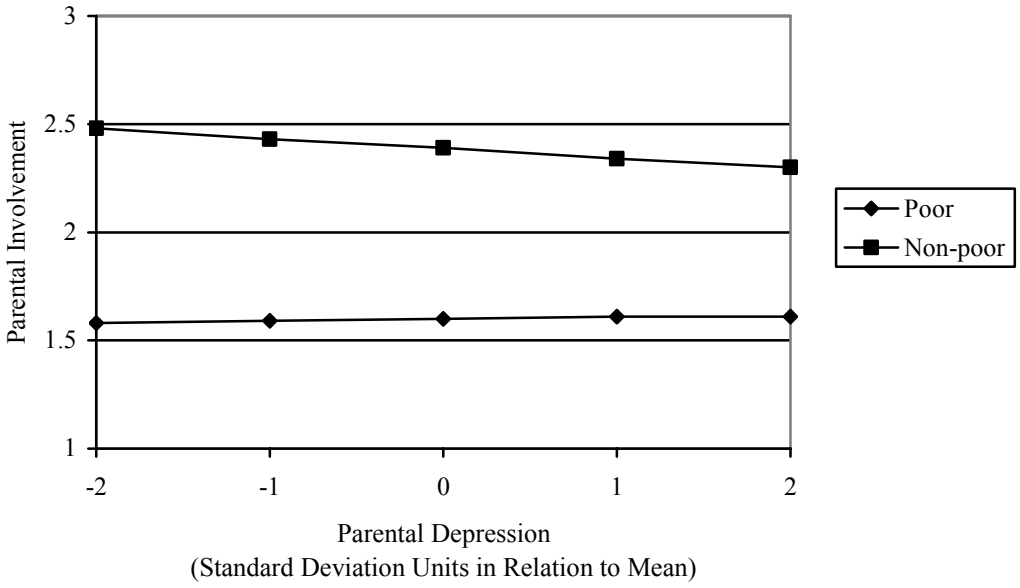
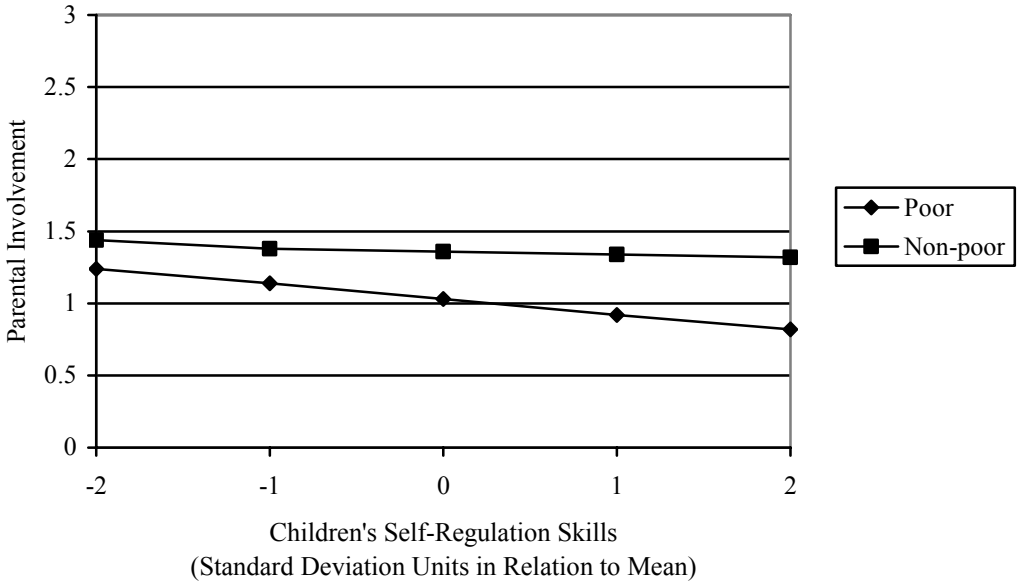


Figure 6. Family Poverty as a Moderator of the Association between Children's Self-Regulation Skills and Parental Involvement in Education



with high behavioral self-regulation skills had less involved parents, but this was especially true for poor children. In contrast, children with high interpersonal skills had more involved parents, particularly if they were poor. Finally, parents who held high academic expectations were more involved in their children's education, but whether expectations were more important for poor or non-poor children was not clear.

In the following sections, I investigate whether similar patterns emerge across African American, Asian American, European American, and Latino/a families. In other words, does living in poverty change the direction and/or strength of the association between the parent/child characteristics and parental involvement in analogous ways across racial/ethnic groups? I begin by discussing differences among the four racial/ethnic groups on the parent and child characteristics and then summarize results of the multilevel models for each racial/ethnic group. Tables presenting the results for each of the four racial/ethnic groups are provided in Appendix D.

DESCRIPTIVE ANALYSES BY RACE/ETHNICITY

Significant differences were found among the racial/ethnic groups on parents' academic expectations (see Table 29). Asian American parents reported having the highest expectations for their children followed by Latino/a, African American, and European American parents. African American parents were more depressed than Asian American, Latino/a, and European American parents. According to their teachers, Asian American and European American children had the highest levels of behavioral self-regulation and interpersonal skills followed by Latino/a children and then African American children.

Table 29. Parent and Child Characteristics by Race/Ethnicity

	Means (SD)			
	African American	Asian American	Latino/a	European American
Parent characteristics				
Academic expectations	4.16[a]	4.44[a]	4.36[a]	3.99[a]
	(1.22)	(1.03)	(1.23)	(0.98)
Depression	1.56[abc]	1.40[a]	1.43[b]	1.41[c]
	(0.53)	(0.43)	(0.48)	(0.41)
Child characteristics				
Behavioral self-regulations skills	2.99[ab]	3.29[a]	3.19 [ab]	3.26[b]
	(0.67)	(0.57)	(0.61)	(0.60)
Interpersonal skills	2.99[ab]	3.20[a]	3.12[ab]	3.20[b]
	(0.67)	(0.61)	(0.62)	(0.62)
n	1506	744	1707	6994

Note. Means with the same superscript within each row were significantly different at $\alpha = .05$, as determined by Duncan's Multiple Range Test. Parents' academic expectations range from 1 to 6 with higher scores representing higher expectations. Parental depression ranges from 1 to 4 with higher scores indicating higher levels of depression. Children's behavioral self-regulation and interpersonal skills range from 1 to 4 with higher scores indicating a higher level of skill.

MULTILEVEL ANALYSES

For African American families, family poverty moderated the association between parents' academic expectations and parental involvement in education. The moderating effect of family poverty, however, depended on the form of parental involvement. I found a small, negative association between parents' academic expectations and games/puzzles activities in non-poor homes and a positive association in poor homes. In contrast, parents' academic expectations were positively related to nature/science activities for both poor and non-poor families, but the association was stronger for non-poor families than poor families.

In Asian American families, I found that family poverty did not significantly interact with any of the parent or child characteristics. These findings suggest that none of the parent or child characteristics examined in this study protected against the negative effects of poverty on parental involvement. At the same time, the association between

the parent or child characteristics and parental involvement did not appear to vary according to the families' economic status.

In Latino/a families, family poverty significantly interacted with each of the parent and child characteristics. Consistent with the findings for the full sample, parents' academic expectations were positively related to parental involvement, and an increase in expectations was associated with a greater increase in involvement for non-poor families than for poor families. Also in line with previous findings, I found that the association between parental depression and parental involvement was negative for non-poor families and positive for poor families.

As with the full sample, children's behavioral self-regulation skills were negatively related to building activities and to reading activities for poor and non-poor Latino/a families, and the inverse associations were stronger for families living in poverty compared to more affluent families. Family poverty also moderated the association between self-regulation and parental involvement at school. Contrary to previous findings, however, the association was positive for non-poor families and negative for poor families. Children's interpersonal skills were positively related to parental involvement in poor and non-poor Latino/a families, and an increase in interpersonal skills was associated with a greater increase in involvement for poor families than for their more affluent counterparts.

Family poverty also interacted with each of the parent and child characteristics in European American families. Interpreting the interactions revealed that, as before, family poverty moderated the association between the parent or child characteristic and parental involvement in education. Furthermore, the interpretation of the significant interactions

for European American families was identical for families in the full sample. Parents who held high academic expectations were more involved in their children's education than parents with low expectations. Whether parents' expectations were more important for poor or non-poor children, however, depended on the type of involvement. Depressed parents were less involved in their children's education in non-poor families and more involved in poor families compared to non-depressed parents. Poor and non-poor children with high behavioral self-regulation skills had less involved parents, but this was especially true for poor children. In contrast, children with high interpersonal skills had highly involved parents, but the positive association between interpersonal skills and parental involvement was stronger for poor children than their more affluent peers.

Chapter 6

Discussion

The purpose of this dissertation was to investigate the educational lives of economically disadvantaged children during a critical transition of the early life course: the transition into elementary school. Past research has demonstrated that economically disadvantaged children begin school with significantly lower cognitive skills than their more advantaged peers and that the gap between poor and non-poor children widens as they move through the American educational system (Lee & Burkam, 2002). Less is known, however, about how poverty influences children's early education, who is most/least at risk, and what can be done to improve the educational chances of economically disadvantaged children. This dissertation addressed these three issues by drawing on a core theoretical perspective of human development—the family process model—to examine the transition to elementary school. Specifically, in three related studies, I investigated: (1) parental involvement in education as a family process that potentially mediated the association between family poverty and children's early reading and math achievement, (2) racial/ethnic differences in the academic importance of parental involvement, and (3) parent and child characteristics that potentially protected against the negative impact of family poverty on parental involvement.

THE IMPORTANCE OF PARENTAL INVOLVEMENT AT SCHOOL

The first study addressed the question of how poverty influences educational outcomes during early childhood. Past research on older children and adolescents highlights the importance of family processes for explaining the adverse effects of

poverty on developmental outcomes (Elder, et al., 1995; Gutman & Eccles, 1999; McLoyd, 1998; Mistry et al., 2002). This study extended previous work by examining whether family processes link poverty to educational outcomes at the start of formal schooling. I hypothesized that parental involvement in education would mediate the association between family poverty and children's math and reading achievement in first and third grade.

Contrary to expectations, I found that none of the parental involvement at home measures explained the negative effects of family poverty on children's early academic achievement. It is important to note that these findings do not suggest that home-based involvement was academically unimportant during the transition to elementary school. Instead, involvement at home did not serve as a mediator because family poverty was not significantly related to home-based involvement after controlling for individual- and school-level variables.

One explanation for this unexpected finding may be that similar levels of home-based involvement in poor and non-poor families mask important differences in the nature of such involvement. In the present study, for example, poor parents may play games with their children as often as non-poor parents. The specific behaviors or interactions engaged in during game-playing, however, may be more educational in nature in non-poor families compared to poor families. Indeed, previous research has demonstrated that the nature of literacy materials and the goals for using literacy depend on the socioeconomic status of the family (McCarthey, 1997). Although non-poor families may interact with their children in ways that are more oriented toward educational goals, more research is necessary to confirm this hypothesis because ECLS-K

does not measure the nature of interactions between parents and children during home-learning activities.

A second explanation may relate to differences in the ways that poor and non-poor parents support their children's education outside the home context. For example, economically disadvantaged and more affluent parents may engage their children in similar levels of home-based activities related to building, games/puzzles, nature/science, and reading. Non-poor parents, however, may also have the time and financial resources for, as well as greater access to, educational activities in the community (e.g., music lessons, trips to libraries and museums, and education-related summer camps; Furstenberg et al., 1999).

In line with expectations, I found that parental involvement at school was a significant mediator of the link between family poverty and children's achievement during the transition to elementary school. Involvement in the school context also mediated the association between family poverty and children's reading achievement in third grade, controlling for prior reading achievement.

These findings contribute to the literature on economically disadvantaged children's early educational experiences in two key ways. First, my results point to the importance of parental involvement in the school context for explaining the negative effects of poverty on the transition to elementary school. Living in poverty represents a barrier to school involvement which, in turn, disrupts the achievement of children as they enter formal schooling. As discussed, the lower involvement of economically disadvantaged parents has been attributed to a wide-range of family, teacher, and school characteristics. For example, although economically disadvantaged parents desire

involvement in their children's schools, the financial and time constraints that often coincide with poverty as well as poor parents' beliefs that they are less knowledgeable about the educational system and less capable of intervening on behalf of their children may constrain their involvement at school (Crosnoe et al., 2002; Edin & Lein, 1997; Furstenberg et al., 1999; Lareau, 2004). Additionally, schools may unintentionally discourage poor parents' involvement at school if they have low academic expectations of poor children and negative perceptions about the attitudes and values of their parents (Alexander, Entwisle, & Thompson, 1987; Lareau & Horvat, 1999; Muller, 2001).

Regardless of why economically disadvantaged parents are less involved in their children's schools, the results of this study suggest that their lower involvement levels do not bode well for poor children's ability to successfully transition into elementary school. If less involvement at school translates into less communication with teachers, school counselors, and administrators, then uninvolved poor parents may lack critical information about their children's performance and progress, about how to reinforce children's learning at home, and about school services and resources. In turn, these parents may be less able to support and shape the academic development of their children during this critical transition period.

Second, this study informs our understanding of poor children's early schooling experiences by investigating whether the effects of early parental involvement are long-lasting or limited to contemporaneous relations with achievement. I found that poor children have lower levels of third grade achievement compared to more affluent children and that, to some extent, parental involvement at school explains the negative effects of poverty on children's third grade reading achievement (controlling for first grade

reading). Involvement (either at home or at school), however, did not link poverty and third grade math, suggesting that the lower third grade math achievement of economically disadvantaged children is related to factors other than their parents' involvement at the start of elementary school. Indeed, research suggests that the initial educational gap between poor and more advantaged children may be fueled by differences in school quality (Kozol, 1991).

The results of this first study suggest that the transition into elementary school poses a greater challenge for economically disadvantaged children than their more affluent peers but that parents' involvement at school can help ease the transition. Because this study points to the importance of involvement in the school setting, teachers and administrators play a critical role in promoting the involvement of economically disadvantaged parents. Specifically, schools encourage involvement at school when they train teachers and administrators to interact and work with parents, have a routine system for communicating with parents, and provide a broad range of opportunities for involvement that are directly linked to children's achievement (Smith et al., 1997; Weiss & Edwards, 1992). Increasing the school involvement of economically disadvantaged parents, in particular, will require schools to target barriers that adversely affect involvement in this population (e.g., parental beliefs that schools do not welcome their involvement; Lareau, 2003).

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH. More research is necessary to investigate the role of parental involvement in economically disadvantaged families and to inform educational programs targeting such involvement during the transition to elementary school. First, this study measured home-based parental

involvement with four important indicators of home learning during early childhood—the extent to which parents engage their young children in learning activities related to building, games/puzzles, nature/science, and reading. Yet, other home learning activities likely influence children's early academic achievement and may explain differences between poor and more affluent children in their levels of achievement. In addition, because the measures of home-based involvement were assessed separately, this study investigated the effects of poverty on specific behaviors and not on involvement in general. Thus, gaining a better understanding of the home-based involvement of economically disadvantaged families will require investigating additional home learning activities and constructing a composite of involvement with a strong alpha.

Second, this study's investigation of parental involvement at home focused exclusively on home learning activities. Yet, research has provided evidence to suggest that emotional and motivational forms of home-based involvement (e.g., academic expectations, emotional support, and demandingness) have a powerful influence on educational outcomes (Singh et al., 1995; Suizzo & Soon, in press). Indeed, parents' academic expectations have been found to be more important for children's academic achievement than involvement in the school context (Fan, 2001; Singh et al., 1995). This literature suggests a need to investigate the role of emotional and motivational involvement in the educational lives of young economically disadvantaged children. Research has already demonstrated that poverty disrupts parents' emotional and motivational involvement (Crosnoe et al., 2002). What is unknown, however, is whether these forms of involvement explain the negative effects of poverty on children's ability to successfully transition into elementary school.

Third, this study investigated parental involvement in education at one point in time. Past research on older children and adolescents, however, has demonstrated the value of investigating patterns of continuity and change in parental involvement over time (Crosnoe, 2001; Hill et al., 2004; Muller, 1998). Although some research has examined trajectories of involvement during elementary school (Sy & Schulenberg, 2005), little is know about the frequency and types of involvement that economically disadvantaged parents engage in during these critical years. Efforts to increase the involvement of economically disadvantaged parents could benefit from research that addresses questions such as: Do economically disadvantaged parents' levels of involvement change as their children move through the early years of schooling? Do economically disadvantaged parents adapt the types of involvement they employ to meet the changing needs of their young children? To what extent does the involvement of parents over time explain the increasing educational gap between poor and more advantaged children?

Fourth, this study focused exclusively on the academic achievement of economically disadvantaged children at the start of formal schooling. Yet, children's psychosocial competence plays a key role in their ability to successfully transition into and through elementary school (Raver, 2002). As such, a valuable avenue for future research includes investigating the family processes, including parental involvement in education, that contribute to or detract from the psychosocial functioning of economically disadvantaged children. For example, what are the parenting practices and/or aspects of parents' marital relationships that explain the negative effects of poverty on children's psychosocial development during early childhood? What aspects of the family context

allow some economically disadvantaged children to remain on healthy psychosocial trajectories despite exposure to multiple stressors? What are the implications of economically disadvantaged children's psychosocial functioning for educational outcomes, especially their ability to successfully transition into elementary school?

Finally, although the family is a primary context of children's academic and psychosocial development, family processes are often difficult to manipulate through social policy. Perhaps the most pressing extension of this study, therefore, is to identify the specific policy-amenable factors that promote school readiness in economically disadvantaged children prior to the start of formal schooling. A valuable next step includes investigating the role that early learning contexts play in addressing the academic and psychosocial problems that pose a risk to children's early school success. For example, what are the characteristics of preschool teachers who effectively deal with the academic and psychosocial difficulties that some poor children experience? What are the ways in which high quality child care and preschool settings promote the psychosocial and academic development of economically disadvantaged children as they transition into formal schooling (e.g., through teacher-training or resources to families)?

VARIATIONS AMONG RACIALLY/ETHNICALLY DIVERSE FAMILIES

The second study of this dissertation investigated the equivalence of the proposed mediational model of family poverty, parental involvement in education, and children's early academic achievement for African American, Asian American, Latino/a, and European American families (see Table 30 for a summary of the major findings for Studies 1 and 2). Past research investigating family processes that mediate the

Table 30. Summary of Findings for Studies One and Two

	Full Sample	African American	Asian American	European American	Latino/a
Poverty → building					
Poverty → building → achievement					
Poverty → games/puzzles					
Poverty → games/puzzles → achievement					
Poverty → nature/science		X	X		
Poverty → nature/science → achievement					
Poverty → reading					X
Poverty → reading → Achievement					
Poverty → school involvement	X	X	X	X	X
Poverty → school involvement → 1st math	X	X		X	
Poverty → school involvement → 1st reading	X			X	
Poverty → school involvement → 3rd math					
Poverty → school involvement → 3rd reading	X			X	

Note. "X" represents a statistically significant association or a statistically significant mediational effect.

association between poverty and children's development has often failed to examine the robustness of their findings for different racial/ethnic groups (see Gutman & Eccles, 1999, as a notable exception). Yet, the effects of poverty on family processes and the effects of family processes on children's development likely vary across race/ethnicity (McLoyd, 1998; Parke et al., 2004), suggesting that the role of family processes in the lives of economically disadvantaged children may depend on the racial/ethnic background of the family. This second study extended previous research by investigating the academic importance of parental involvement in education for poor children's early academic achievement in four diverse racial/ethnic groups.

Beginning with parental involvement in the home context, I found that involvement at home did not mediate the association between family poverty and children's early academic achievement for any racial/ethnic population in this study. Investigating the various pieces of the mediational model (i.e., the effects of poverty on parental involvement at home and the effects of involvement at home on children's early academic achievement), however, revealed that the reasons for this null finding differed by race/ethnicity. Specifically, family poverty did not appear to disrupt parental involvement at home in European American families. Poverty, however, was negatively related to some home-based involvement activities in racial/ethnic minority families but not in ways that influenced children's early academic achievement.

For European Americans, as for the full sample, parental involvement at home was not a significant mediator because family poverty was not related to any of the home-based measures of involvement. As discussed, one reason for this finding may be that similar levels of home-based involvement in poor and non-poor families mask important differences in the nature of such involvement. Additionally, poverty is a multifaceted phenomenon, and the effects of poverty on families depend on the timing, duration, and context in which it is experienced (Duncan & Brooks-Gunn, 2000; Duncan, Brooks-Gunn, & Klebanov, 1994; Elder, 1999). European American families are less likely to live in persistent poverty and to live in areas of concentrated poverty than racial/ethnic minority families (Koval, 1991; McLoyd, 1998). As a result, the effects of poverty on parental involvement at home may be weaker for European American parents compared to their racial/ethnic minority counterparts.

In African American and Asian American families, family poverty was not related to building, games/puzzles, or reading activities, but it was negatively associated with nature/science activities. This home involvement measure was not a significant mediator of the association between family poverty and children's achievement, however, because nature/science activities were not related to achievement. In Latino/a families, poverty was negatively related to reading but not to any of the other home involvement measures. Reading activities did not mediate the association between family poverty and children's achievement, however, because reading did not predict children's achievement.

The lack of association between these home involvement activities and children's achievement may exist because the same home-based involvement activities serve different functions across the various racial/ethnic groups. In other words, although parents from diverse racial/ethnic backgrounds engage their children in many of the same education-related activities at home (Ho & Willms, 1996; Okagaki & Frensch, 1998; Suizzo & Stapleton, in press), the meanings attributed by parents to these activities may depend on the racial, ethnic, or cultural background of the family (Bornstein, 1995). For example, parents may read with their young children to increase their understanding of academic concepts, to teach them moral or religious lessons, or simply as a way to bond with them. If the purpose for reading is associated with the parents' racial/ethnic background, then differences in the effects of reading on achievement across race/ethnicity would be expected.

The non-significant association between involvement at home and children's achievement may also have occurred because the involvement activities investigated in this study fail to capture what is academically most important about parental involvement

in each of the racial/ethnic groups. As discussed, parents' education-related beliefs (e.g., the importance of effort versus ability), expectations (e.g., whether their children will attend college) and approaches for supporting children's education (e.g., direct versus indirect methods of instruction) are embedded in the context of race/ethnicity (Chen & Stevenson, 1995; Okagaki & Frensch, 1998; Suizzo, Robinson, & Pahlke, 2006) and may have stronger effects on children's achievement than any one involvement activity like reading or playing puzzles.

Turning to parental involvement in the school context, I found that in European American families, parental involvement at school significantly mediated the association between family poverty and children's math and reading achievement in first grade and children's reading achievement in third grade. Involvement at school also explained the link between family poverty and African American children's first grade math achievement but not first grade reading, third grade math, or third grade reading. Parental involvement at school was not a significant mediator for Asian American or Latino/a families. In general, involvement at school did not mediate the association between poverty and children's early achievement for racial/ethnic minority families because school-based involvement was not related to children's achievement.

Racial/ethnic differences in the effects of school-based involvement on children's early achievement may exist for several reasons. First, the lack of association between involvement at school and children's achievement in racial/ethnic minority families may relate to differences in the levels of school-based involvement across race/ethnicity. The results of this study are consistent with previous research suggesting that racial/ethnic minority parents are less likely to support their children's education through school-based

involvement than European American parents (Ho & Willms, 1996). Consequently, if racial/ethnic minority parents are not consistently involved at their children's school, then their involvement may have a smaller impact on children's academic performance.

Second, differences in the nature of parents' school-based involvement across race/ethnicity may exist. For example, parents, regardless of their racial/ethnic background, may communicate with teachers when their children experience problems in school. Yet, given the language difficulties and negative experiences that some racial/ethnic minority parents face in their children's school (Carreón, Drake, & Barton, 2005; Lareau & Horvat, 1999), the involvement of racial/ethnic minority parents may more likely be teacher-initiated while European American parents may engage in more parent-initiated involvement. The distinction between the two types of involvement is important because parent-initiated involvement has been associated with success in school, while teacher-initiated involvement is often related to academic problems (Epstein, 1996).

Third, parental involvement (whether at home or at school) may be academically less important for racial/ethnic minority children, especially African American and Latino/a children, than for European American children because of the additional barriers associated with racial/ethnic minority status in the United States. This body of literature suggests that the lower achievement of African American and Latino/a children may be less related to family processes and more a function of persistent poverty, segregation, and discrimination (Ogbu, 1991; Suárez-Orozco & Suárez-Orozco, 1995; Valdés, 1997). Consequently, racial/ethnic minority parents' attempts to boost the academic performance

of their young children through involvement in the schooling process may be less effective than the efforts of European American parents.

The results of this study represent a first step in the effort to understand the role of parental involvement in the lives of racially/ethnically diverse poor children during a critical transition of the early life course. My findings provide evidence that the academic importance of various forms of involvement depends on the racial/ethnic background of the family and thus underscore the need to examine developmental models across racial/ethnic subsets of the population.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH. More research is necessary to examine racial/ethnic differences in the involvement of economically disadvantaged parents and in the effects of involvement on children during the transition to elementary school. A first avenue for this research involves investigating the specific ways in which parents within racial/ethnic groups support their children's education at the start of school. The research of Ogbu (1991) and Lareau (2003) suggest that a qualitative approach would be particularly helpful for examining motivational and emotional forms of involvement and for elucidating the processes through which parents' education-related beliefs and behaviors influence children's early academic outcomes in racially/ethnically diverse homes.

Second, future research should investigate the role of the school context in the involvement of racial/ethnic minority parents by addressing questions such as how do schools that serve racial/ethnic minority families contribute to their lower levels of school-based involvement at the start of formal schooling (e.g., through lack of opportunity for involvement or through the negative perceptions and beliefs that some

school personnel hold about racial/ethnic minority parents and their children; Lareau, 2003; Liontos, 1992)? Does the school context condition the effects of involvement on children's early achievement such that involvement is less beneficial for racial/ethnic minority children than for European American children? For example, even though Spanish-speaking Latino/a parents desire and seek involvement at school (Sánchez & López, 1999), if they are unable to communicate with teachers, counselors, and administrators, then their involvement (both at home and at school) may have a smaller impact on their children's ability to successfully transition into elementary school.

Third, ECLS-K differentiated groups according to their broad racial/ethnic group affiliation (i.e., African American, Asian American, European American, Latino/a, and Other). As pointed out by Suizzo and Stapleton (in press) in a study that draws on ECLS-K data to investigate racial/ethnic differences in parental involvement, this is problematic because Latino/a and Asian American families vary greatly with regard to country of origin, circumstances related to their arrival and residence in the United States, and acculturation level (Chao & Tseng, 2002; Delgado-Gaitan, 1993; Harwood, Leyendecker, Carlson, Asencio, & Miller, 2002). An important avenue for future research, therefore, involves investigating within-group differences in education-related beliefs and practices and in the importance of parental involvement for children's early academic achievement.

RESILIENCE AMONG ECONOMICALLY DISADVANTAGED FAMILIES

The first two studies of this dissertation focused on the stark reality of growing up in the context of poverty. The results of the first study suggest that, to some extent, poverty disrupts the involvement of poor parents which, in turn, negatively influences the

achievement of their children during the transition to elementary school. Although poor parents are typically less involved in their children's education than more affluent parents (Heymann, 2000), the effects of poverty on parental involvement cannot be understood independent of the emotional and social well-being of the families. In other words, economically disadvantaged parents and children may have emotional and social characteristics that condition the association between poverty and parental involvement. The third study of this dissertation, therefore, explored potential sources of resilience in economically disadvantaged families by examining parent and child characteristics that protected against the adverse effects of family poverty on parental involvement in education. Specifically, I investigated parents' psychological well-being and academic expectations and children's behavioral self-regulation and interpersonal skills. I expected that the negative effects of poverty on parental involvement would be lower for families who reported high levels of these characteristics.

In line with expectations, I found that family poverty interacted with each of the parent and child characteristics. Interpreting the significant interactions, however, revealed that family poverty and not the parent/child characteristics served as the moderating variable. In other words, family poverty moderated the association between the parent or child characteristics and parental involvement in education.

PARENTAL CHARACTERISTICS. Beginning with parents' psychological well-being, I found that family poverty conditioned the effects of depression on parental involvement in education. In non-poor families, as parents' depression increased, parental involvement in education decreased. In poor families, however, depressed and non-depressed parents reported equal levels of involvement. Little is known about the

effects of parents' psychological well-being on parental involvement in education (Oyserman, Bybee, Mowbray, & McFarlane, 2002). The few studies that have investigated the association between parental depression and parental involvement in education suggest that depressed parents are less involved in their children's education (Kohl et al., 2000; Murray et al., 2006). This research, however, has yet to examine the involvement of poor, depressed parents. The results of this study suggest that depression may be less of a deterrent to the involvement of poor parents, but more research is needed to understand the factors that explain and/or condition the link between depression and parental involvement in the context of poverty.

Next, I found that family poverty moderated the association between parents' academic expectations and parental involvement in education during the transition to elementary school. Parents who held high academic expectations were more involved in their children's education. Whether high expectations was more beneficial for poor or non-poor families, however, depended on the type of involvement investigated. Specifically, the positive effects of high expectations on home-based involvement were stronger for non-poor parents than poor parents. The opposite was true for school-based involvement; high expectations were more important for the school-based involvement of poor parents compared to more affluent parents. This finding informs practices and programs designed to increase the involvement of economically disadvantaged families at the start of formal schooling. Previous research has demonstrated that, in general, poor parents are less involved in their children's schools. The results of this study, however, suggest that finding ways to raise the expectations that poor parents hold for their children could, in turn, increase the school-based involvement of an at-risk population.

Although little research has investigated the determinants of parents' academic expectations, the work of Hao and Bonstead-Bruns (1998) suggests that helping families to improve and increase communication about school and learning can increase the expectations of both children and parents.

CHILD CHARACTERISTICS. I also found that family poverty conditioned the effects of the child characteristics on parental involvement in education during the transition to school. First, poor and non-poor children with high behavioral self-regulation skills had less involved parents, but this was especially true for poor children. Research on the involvement of parents of older children and adolescents may explain this unexpected finding. This literature suggests that involvement is context-specific such that parents base their involvement on the needs of their children (Crosnoe, 2001; Muller, 1998). In other words, in homes where children are able to regulate their behavior, parents may become less involved if their children demonstrate that they can work on learning activities without their parents' assistance. This may be especially true in economically disadvantaged homes because poor parents are already coping with a wide array of poverty-related stressors that make involvement more difficult (Furstenberg et al., 1999).

Second, the association between children's interpersonal skills and parental involvement in education was moderated by family poverty. Children with high interpersonal skills had parents who were more involved in their education at the start of school. The positive effect of interpersonal skills on parental involvement, however, was stronger in poor families than in more affluent families. This finding is consistent with previous research suggesting that because economically disadvantaged children have

fewer resources overall, they tend to benefit more from these resources than middle- or upper-class children. As one example, in a study of parents' and children's engagement in the schooling process, Cooper and Crosnoe (in press) found that the positive association between children's academic orientation and parental involvement in education was stronger for economically disadvantaged families than for non-disadvantaged families. This general phenomenon, often referred to as "functional substitution" (Mirowsky & Ross, 2003), may also hold here if economically disadvantaged children with high interpersonal skills are better able to elicit the involvement of their parents than their more affluent counterparts.

Previous research has demonstrated that children's interpersonal skills are a primary component of school readiness (Raver, 2002). The results of this study suggest that interpersonal skills may also help children, especially economically disadvantaged children, by increasing the involvement of their parents. As a result, educational interventions that target children's interpersonal skills at the start of school may promote the readiness of low-income children directly and indirectly by influencing parental involvement in education.

VARIATIONS ACROSS RACIAL/ETHNIC GROUPS. Poverty affects families of all races/ethnicities. Yet, the experience of living in poverty is likely influenced by cultural, economic, and historical factors associated with race/ethnicity (McLoyd, 1998). The challenges faced by poor families as well as the factors that promote resilience among poor families, therefore, likely depend on the racial/ethnic background of the family. In this study, I investigated whether the protective role of the parent and child characteristics varied across the four racial/ethnic groups.

Beginning with parents' academic expectations, in African American, Latino/a, and European American families, parents' expectations were positively related to parental involvement in education. As with the full sample, however, the positive effects of high expectations on parental involvement were, at times, stronger for non-poor families than for poor families. Also in line with my previous findings, I found that the positive association between children's interpersonal skills and parental involvement in education was stronger in poor Latino/a and European American families than in their more affluent counterparts. Notably, none of the parent or child characteristics interacted with family poverty for Asian American families, suggesting that these characteristics may be less important for explaining high levels of involvement among poor Asian American parents.

These findings have important implications for studying the involvement of economically disadvantaged families from diverse racial/ethnic groups. Specifically, the results of this study suggest that identifying factors that promote the involvement of economically disadvantaged parents requires a consideration of race/ethnicity. Families may have social and psychological resources unique to their race, ethnicity, or culture that help to protect against the negative effects of poverty on parental involvement during the transition to elementary school.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH. More research is necessary to understand how some parents manage to maintain involvement in their young children's education despite the challenges associated with living in poverty. This study suggests that the association between children's interpersonal skills and parental involvement in education is stronger in economically disadvantaged families than in

more affluent families. A first avenue for future research, therefore, involves investigating this association over time. A longitudinal approach would be valuable for establishing the directionality of the association between children's interpersonal skills and parental involvement in economically disadvantaged families and for considering the long-term educational consequences (e.g., graduation and enrollment in higher education) of this association.

Second, this study focused on protective factors related to the social and emotional well-being of economically disadvantaged families. Yet, the extent to which parents are involved in their children's education is not just a function of individual characteristics of family members but is also influenced by the connection (or lack thereof) between families and schools (Epstein, 1995). Past research has suggested that providing information on how schools function, how to support learning at home, and how to improve children's social and behavioral skills, as well as creating ample opportunities for communication with teachers, administrators, and counselors may encourage parental involvement in education (Epstein, 1986; Christenson et al., 1997; Liontos, 1992). Research has yet to investigate, however, whether these school-based factors counteract the negative effects of poverty on parental involvement during the transition to elementary school.

Third, future studies are needed to identify factors within racial/ethnic groups that moderate the association between poverty and parental involvement in education. Past research on factors that promote positive parenting practices in various racial/ethnic populations may help to guide these investigations. For example, in African American and Latino/a families, support from the larger kin system and social ties beyond the

family are positively related to optimal parenting (Kotchick, Dorsey, & Heller, 2005; Stevens, 1988; Uno, Florsheim, & Uchino, 1998). A valuable next step in this research is to examine which of these factors influence education-related parenting beliefs and behaviors and act as protective factors in poor African American and Latino/a families.

CONCLUSION

This dissertation contributed to the base of knowledge on risk and resilience in the education of economically disadvantaged children in three primary ways. First, I identified a family process through which poverty affects children's academic achievement at the start of formal schooling. To some extent, family poverty negatively affected parents' school-based involvement which, in turn, disrupted children's ability to successfully transition into school. Second, I found that the academic importance of parental involvement in education for poor children varied across diverse racial/ethnic groups. Specifically, the effects of involvement on children's early achievement were, in general, lower for racial/ethnic minority children than for European American children. Third, I identified parent and child characteristics that may counterbalance the early educational risks associated with poverty. Economically disadvantaged parents with high expectations were more involved in their children's education than disadvantaged parents who held low expectations. Children's interpersonal skills were also related to parental involvement in poor families, and the association between parental involvement and interpersonal skills appeared stronger for poor families than for non-poor families.

The results of this dissertation offer insight into a great irony of American education—the groups that benefit most from education often have the most trouble

attaining educational credentials. As pointed out by Lee and Burkam (2002), the inequalities in children's academic achievement are substantial right from the starting gate. The educational gap between poor and more affluent children at the start of school, however, is not just a question of finance. This dissertation provides evidence that family processes, such as parental involvement in education, play a key role in the educational lives of economically disadvantaged children. Understanding the importance of parental involvement for children's early achievement, however, will require consideration of the types of involvement employed by parents within racial/ethnic groups. The results of this dissertation also suggest that the social and emotional characteristics of poor, resilient families may be important resources to leverage in our attempts to understand and combat the intergenerational transmission of poverty.

Appendix A

Table A1. Measures of Family Poverty, Parental Education, Parental Employment, and Family Structure

Variable	Description
Family poverty	Parents reported the annual family income for the past year in the kindergarten data collection (WKINCOME). Parents also reported the total number of people living in the household during that same time period (P1HTOTAL). The income measure was divided by the household size measure and then compared to the Federal Poverty Line (FPL) for 1998 reported by the U.S. Census Bureau. This allowed for the creation of three markers of poverty: annual income at or below 100%, between 101% and 200%, and above 200% of the FPL.
Parent education	In the kindergarten data collection, parents were asked about their years of completed schooling. ECLS-K generated a nine-category variable, ranging from eighth grade or less to doctoral/professional degree, for each parent (WKMOMED, WKDADED). These two variables were recoded into five categories (1 = less than high school, 2 = high school graduation, 3 = some post-high school education, 4 = college graduate, 5 = post-graduate degree). In single-parent families, the value of the present parent served as the final measure of parent education. In two-parent families, the highest value of the two parents served as the final measure.
Parent employment	Both parents reported the number of hours per week that they worked, on average, at their current employment during the kindergarten data collection (P1HMEMP for mother, P1HDEMP for father). Their responses were used to create a set of dummy variables for mothers' current employment status: currently working full-time, part-time, not working, and mother absent. The same set of dummy variables was created for the father.
Family structure	In the kindergarten data collection, parents reported the type of household in which the child currently lived (P1HPARNT). This information was used to create a binary measure of family structure (two biological/adoptive parents versus other).

Table A2. Individual-Level Control Variables

Variable	Description
Gender	ECLS-K provides the gender of each child (GENDER), which was converted to a binary item for female status (1 = female, 0 = male).
Race/ethnicity	ECLS-K provides a set of binary variables designating the race/ethnicity of each child, reported by the parents during the kindergarten data collection (WHHISP, WKBLACK, WKASIAN, WKAMERIN, WKMT1RAC, WKWHITE). Drawing on conventions in the National Longitudinal Study of Adolescent Health, I created a five-category variable in which each child was assigned to one category with a system that sets a priority for each category. For example, Latino/a was prioritized over European American, so children listed as both were designated as Latino/a. This variable was then broken up into dummy variables for African American, Asian American, European American, Latino/a, and Other race/ethnicity.
Age	ECLS-K provides the children's ages in months in the kindergarten data collection (R1_KAGE).
First-time kindergartener	Some of the children in the original kindergarten sample were enrolled in kindergarten for the first time, while others had repeated. ECLS-K provides a binary marker (1 = first time) to differentiate these two groups (P1FIRKDG).
Pre-K child care	In the kindergarten data collection, parents reported whether their children had spent time regularly in non-parental child care in the year before they entered kindergarten and, if so, what type. ECLS-K provides a nine-category variable (P1PRIMPK) to consolidate this information. This variable was recoded into eight dummy variables: parental, relative, non-relative, pre-school, center-based day care, Head Start, and other.
Language status of assessment	Spanish-speaking children who scored below an established threshold on the Oral Language Development Scale were allowed to take the math assessment (but not the reading assessment) in Spanish. ECLS-K provides markers that identified these children: C1SPASMT (kindergarten), C4SPASMT (first grade), and C5SPASMT (third grade).
Timing of assessment	At each data collection, children took the achievement tests over a span of several months. Thus, some children had more learning time in school before taking the test than others. To control for the possibility of bias related to this timeline, I created a measure that gauged the length of time between when the first assessment was given during that data collection and when the child actually took the assessment using two variables for each data collection: C1ASMTMM, C2ASMTDD (kindergarten), C4ASMTMM, C4ASMTDD (first grade), and C5ASMTMM, C5ASMTDD (third grade).

Table A3. School-Level Control Variables

Variable	Description
School sector	The school administrator identified whether the school was public or private (S2KPUPRI).
School size	The school administrator gave the estimated enrollment of each school (S2KENRLS), which ECLS-K recoded into quasi-continuous categories (1=0-149, 2=150-299, 3=300-499, 4=500-749, 5=750+).
School Title 1	All schools that received Title 1 funding were self-identified by their administrators (S2TT1).
School socioeconomic status	The family-level measure of poverty was aggregated to the school-level by taking the average level of family poverty for all students in a given school.
School region	Schools were sampled according to region. This variable (CREGION) was used to create four dummy variables: (South, West, Northeast, Midwest).
School location	ECLS-K sorted schools into seven categories of urbanicity. These categories were collapsed into three dummy variables: central city, city fringe/large town, and small town/rural.

Table A4. Measures of Cognitive Achievement

Variable	Description
Data	Short, timed assessments were given to each child in math and reading. Children took the first stage of the assessment and, based on their performance, took the low-, medium-, or high-difficulty assessment. Using Item Response Theory (IRT) scores allowed the development of single proficiency scores across test sequences. All scores were recalculated with the addition of each new wave of data collection.
Math	Math assessments included items on conceptual knowledge, procedural knowledge, problem-solving, number sense, number properties/operations, and measurement. IRT scores, based on information from kindergarten through third grade, are contained in C4R2MSCL (spring of first grade) and C5R2RSCL (spring of third grade).
Reading	The reading assessments assessed the ability to define words in context, identify figures of speech, and evaluate passages of text. IRT scores, based on information from kindergarten through third grade, are contained in C4R2RSCL (spring of first grade), and C5R2RSCL (spring of third grade).

Table A5. Measures of Parental Involvement in Education

Variable	Description
Parent involvement at home	In the kindergarten data collection, parents reported how often (1 = not at all, 2 = once or twice a week, 3 = 3 – 6 times a week, 4 = everyday) they engaged their children in learning activities related to building (P1BUILD), games or puzzles (P1GAMES), nature or science (P1NATURE), and reading (P1CHREAD).
Parental involvement at school	Parents reported whether they had engaged (1 = yes) in seven activities at school in the last year during the kindergarten data collection, including PTA functions, parent-teacher conferences, and volunteering at schools (P2ATTENP, P2ATTENB, P2PARADV, P2ATTENS, P2PARGRP, P2VOLUNT, P2FUNDRS). The sum of these items will serve as the final scale (α = .72).

Table A6. Measures of Parent and Child Protective Factors

Variable	Description
Parents psychological well-being	ECLS-K included a condensed version of the Center for Epidemiologic Studies-Depression (CES-D) scale (see Radloff, 1977) in the kindergarten data collection. Parents reported how often, during the past week, that they experienced eleven depressive symptoms, such as lost appetite, trouble sleeping, and fearfulness (P2APPET, P2BLUE, P2KPMIND, P2DEPRES, P2EFFORT, P2FEARFL, P2RESTLS, P2TALKLS, P2LONELY, P2SAD, P2NOTGO). Responses (1 = never, 2 = some of the time, 3 = a moderate amount of time, 4 = most of the time) were averaged to create the final scale (α = .85).
Parents' academic expectations	In the kindergarten data collection, parents were asked how far in school they expected their child to go (1 = receive less than a high school diploma, 2 = graduate from high school, 3 = attend two or more years of college, 4 = finish four- or five-year college degree, 5 = earn a master's degree, and 6 = finish a Ph.D., M.D., or other advanced degree) (P1EXPECT).
Children's behavioral self-regulation	ECLS-K adapted items from the Social Skills Rating Scale (Gresham & Elliott, 1990) to assess children's behavioral self-regulation and interpersonal skills. General descriptions of the measures are provided by ECLS-K, but the copyrighted items are not available for review. In the kindergarten data collection, teachers rated on a four-point scale (1 = never to 4 = very often) children's ability to regulate their behavior. Items assessed how often the child gets angry, argues, or throws tantrums (T2CONTRO). The mean of the items served as the final scale for children's behavioral self-regulation (α = .80).
Children's interpersonal skills	In the kindergarten data collection, teachers rated on a four-point scale (1 = never to 4 = very often) children's interpersonal skills, including their ability to get along with others, express ideas and opinion in positive ways, and show sensitivity to the feelings of others (T2INTERP). The mean of the items served as the final scale for children's interpersonal skills (α = .89).

Appendix B

The first study of this dissertation investigated parental involvement in education as a family process that potentially mediated the association between family poverty and children's academic achievement. This appendix provides the multilevel models designed to examine the mediating effect of parental involvement. The following five models were specified for each of the four dependent variables, math and reading achievement in first and third grade. Also note that the models were specified for each racial/ethnic group separately to address the goal of the second study of the dissertation.

THE FULLY UNCONDITIONAL MODEL

The first step in the analysis was to fit a fully unconditional model (i.e., a multilevel model that contains no explanatory variables in the within-school (or level-1) model or the between-school (or level-2) model). The purpose of the unconditional model for this study was to compute an intraclass correlation, the proportion of total variance between schools. The unconditional within-school model was specified as:

$$Y_{ij} = \beta_{0j} + r_{ij}$$

where Y_{ij} represents the first grade achievement score for student i in school j; β_{0j} represents the within-school intercept; and r_{ij}, the within-school residual, represents the difference between a student's first grade achievement score (Y_{ij}) and the average score for that given student's school (β_{0j}).

The unconditional between-school model was specified as:

$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$

where β_{0j} is permitted to vary around the overall intercept, $\gamma_{00,}$ and $\mu 0j$, the between-

school residual, represents the difference between a given school's average first grade achievement score (β_{0j}) and the overall achievement score average (γ_{00}).

MODEL ESTIMATING THE DIRECT EFFECT OF FAMILY POVERTY

The second step in the analysis was to fit a random coefficient model (i.e., a multilevel model with explanatory variables in the within-school model only) for each of the dummy-coded family poverty variables. The purpose of this model was to estimate and test the direct effect of the family poverty variables. The conditional within-school model represents the first grade achievement score as a function of the family poverty variables (represented by X_{ij1} and X_{ij2}) and error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij1} + \beta_{2j}X_{ij2} + r_{ij}$$

The unconditional between-school model was specified as:

$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$

MODEL ESTIMATING THE EFFECT OF POVERTY NET OF THE POVERTY-RELATED FAMILY CHARACTERISTICS

The third step in the analysis was to fit a random coefficient model for each of the family poverty variables to estimate and test the effect of the family poverty variables controlling for poverty-related family characteristics (i.e., parental education, parental employment, and family structure). The conditional within-school model represents the first grade achievement score as a function of the family poverty variables and the family characteristics (both represented by X_{ij1} through X_{ij5}) and error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij1} + \beta_{2j}X_{ij2} + \beta_{3j}X_{ij3} + \beta_{4j}X_{ij4} + \beta_{5j}X_{ij5} + r_{ij}$$

The unconditional between-school model was specified as:

$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$

MODEL ESTIMATING THE TOTAL EFFECT OF FAMILY POVERTY

The fourth step in the analysis was to fit a fully conditional model (i.e., a multilevel model with explanatory variables in both the within- and between-school models) for each of the dummy-coded family poverty variables. The purpose of the fully conditional model was to estimate and test the effect of the family poverty variables net of the level-1 and level-2 control variables. The conditional within-school model represents the first grade achievement score as a function of family poverty and the level-1 control variables (both represented by X_{ij1} through X_{ij18}) and error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij1} + \ldots + \beta_{18j}X_{ij18} + r_{ij}$$

The conditional between-school model represents the outcome varying as a function of the level-2 control variables (represented by W_{j1} through W_{j9}) and error:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}W_{j1} + \ldots + \gamma_{09}W_{j9} + \mu_{0j}$$

MODEL ESTIMATING THE MEDIATING EFFECT OF PARENTAL INVOLVEMENT IN EDUCATION

The final step in the analysis was to fit a fully conditional model for each of the dummy-coded family poverty variables that added the three parental involvement variables to the within-school model. The purpose of this model was to estimate and test the mediating effect of parental involvement in education. The within-school model represents the first grade achievement score as a function of family poverty, parental involvement in education, the level-1 control variables (all represented by X_{ij1} through X_{ij21}) and error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij1} + \ldots + \beta_{21j}X_{ij21} + r_{ij}$$

The between-school models represent the outcome varying as a function of the level-2 control variables (represented by W_{j1} through W_{j9}) and error:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}W_{j1} + \ldots + \gamma_{09}W_{j9} + \mu_{0j}$$

$\beta_{kj} = \gamma_{k0} + \gamma_{k1}W_{j1} + \ldots + \gamma_{k9}W_{j9} + \mu_{kj}$ for k = 1 through 3 (for each of the three parental involvement variables)

An additional aspect of this analysis warrants further comment. First, an important consideration in multilevel modeling is whether to center the explanatory variables around their corresponding school mean (i.e., group-mean centering) or the overall mean (i.e., grand-mean centering). The purpose of centering is that it allows for a more meaningful interpretation of the model intercepts. For this study, centering of the level-1 and level-2 explanatory variables was unnecessary because interpreting the model intercepts was not relevant to the study design.

Appendix C

The third study of this dissertation investigated parent and child characteristics that potentially moderated the effect of family poverty on parental involvement in education. This appendix provides the multilevel models designed to examine the moderating effect of each of the parent and child characteristics. The following five models were specified for each of the three parental involvement variables, for the full sample, and for each racial/ethnic group separately.

THE FULLY UNCONDITIONAL MODEL

The first step in the analysis was to fit a fully unconditional model. The purpose of the unconditional model was to compute an intraclass correlation. The unconditional within- and between-school models were specified as:

$$Y_{ij} = \beta_{0j} + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$

MODEL ESTIMATING THE DIRECT EFFECT OF FAMILY POVERTY

The second step in the analysis was to fit a random coefficient model (i.e., a multilevel model with explanatory variables in the within-school model only) for each of the dummy-coded family poverty variables. The purpose of this model was to estimate and test the direct effect of the family poverty variables. The conditional within-school model represents parental involvement as a function of the family poverty variables (represented by X_{ij1} and X_{ij2}) and error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij1} + \beta_{2j}X_{ij2} + r_{ij}$$

The unconditional between-school model was specified as:

$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$

MODEL ESTIMATING THE EFFECT OF POVERTY NET OF THE POVERTY-RELATED FAMILY CHARACTERISTICS

The third step in the analysis was to fit a random coefficient model for each of the family poverty variables to estimate and test the effect of family poverty controlling for poverty-related family characteristics (i.e., parental education, parental employment, and family structure). The conditional within-school model represents parental involvement as a function of the family poverty variables and the family characteristics (both represented by X_{ij1} through X_{ij5}) and error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij1} + \beta_{2j}X_{ij2} + \beta_{3j}X_{ij3} + \beta_{4j}X_{ij4} + \beta_{5j}X_{ij5} + r_{ij}$$

The unconditional between-school model was specified as:

$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$

MODEL ESTIMATING THE TOTAL EFFECT OF FAMILY POVERTY

The second step in the analysis was to fit a fully conditional model for each of the dummy-coded family poverty variables. The purpose of this model was to estimate and test the effect of the family-poverty variables net of the level-1 and level-2 control variables. The conditional within-school model represents parental involvement as a function of family poverty and the level-1 control variables (both represented by X_{ij1} through X_{ij18}) and error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij1} + \ldots + \beta_{18j}X_{ij18} + r_{ij}$$

The conditional between-school model represents the outcome varying as a function of the level-2 control variables (represented by W_{j1} through W_{j9}) and error:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}W_{j1} + \ldots + \gamma_{09}W_{j9} + \mu_{0j}$$

MODEL ESTIMATING THE MODERATING EFFECT OF PARENT AND CHILD CHARACTERISTICS

The final step in the analysis was to fit a fully conditional model for each of the dummy-coded family poverty variables that added the parent and child characteristics and interaction variables between family poverty and each of the parent or child characteristics to the within-school model. The purpose of this model was to estimate and test the moderating effect of the parent or child characteristic. The within-school model represents parental involvement as a function of family poverty, parent and child characteristics, the interactions variables, the level-1 control variables (all represented by X_{ij1} through X_{ij26}) and error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij1} + \ldots + \beta_{26j}X_{ij26} + r_{ij}$$

The conditional between-school model represents the outcome varying as a function of the level-2 control variables (represented by W_{j1} through W_{j9}) and error:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}W_{j1} + \ldots + \gamma_{09}W_{j9} + \mu_{0j}$$

As before, the level-1 and level-2 explanatory variables were not centered, and fixed coefficients were used for all level-1 explanatory variables.

Appendix D

Table D1. Results of Multilevel Models Predicting Games/Puzzles Activities for African American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.05	0.04	-0.02	-0.43
101-200% of the FPL (low-income)	0.02	0.07	0.04	0.02
Family characteristics				
Parent education		0.04	0.05+	0.04
Mother employed full-time		0.01	0.02	0.02
Mother employed part-time		-0.03	0.00	0.01
Father employed full-time		-0.01	0.02	0.06
Father employed part-time		0.00	0.01	0.02
Family structure (two-parent)		-0.04	-0.03	-0.06
Individual-level control variables				
Age (years)			-0.14+	-0.14+
Gender (female)			-0.04	-0.06
Year in kindergarten (first)			-0.13	-0.15
Pre-K relative care			-0.07	-0.06
Pre-K non-relative care			-0.34*	-0.36**
Center-care enrollment			-0.18*	-0.18*
Head Start enrollment			-0.12	-0.16+
Other type of child care			-0.08	-0.08
Timing of assessment (days from start)			0.00	0.00
School-level control variables				
Sector (private)			-0.03	-0.01
School size			-0.01	-0.01
School socioeconomic status			0.27+	0.31+
Receipt of Title I funding			-0.01	-0.01
School region: Midwest			0.12	0.10
School region: Northeast			-0.12	-0.13
School region: West			0.00	0.00
School urbanicity: central city			-0.19	-0.22*
School urbanicity: fringe/large town			-0.13	-0.16
Moderating variables				
Parents' academic expectations				-0.03
Parents' depression				0.03
Children's behavioral self-regulation				-0.05
Children's interpersonal skills				0.19
Interactions				
Poor x academic expectations				0.16**
Poor x depression				0.13
Poor x behavioral self-regulation				0.02
Poor x interpersonal skills				-0.17
Low-income x academic expectations				0.12*
Low-income x depression				-0.12

Table D1 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				-0.14
Low-income x interpersonal skills				0.04

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 1,506 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D2. Results of Multilevel Models Predicting Nature/Science Activities for African American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.19**	-0.20**	-0.24**	0.30
101-200% of the FPL (low-income)	-0.04	-0.04	-0.04	0.20
Family characteristics				
Parent education		0.10***	0.10**	0.08*
Mother employed full-time		-0.14*	-0.16**	-0.17**
Mother employed part-time		-0.08	-0.08	-0.08
Father employed full-time		-0.31**	-0.31**	-0.32**
Father employed part-time		-0.06	-0.07	-0.14
Family structure (two-parent)		-0.0005	0.00	-0.04
Individual-level control variables				
Age (years)			0.02	-0.00
Gender (female)			-0.05	-0.09+
Year in kindergarten (first)			0.04	0.01
Pre-K relative care			-0.02	0.02
Pre-K non-relative care			0.04	0.08
Center-care enrollment			0.00	0.05
Head Start enrollment			-0.04	0.00
Other type of child care			0.18+	0.23*
Timing of assessment (days from start)			0.00	0.00
School-level control variables				
Sector (private)			0.05	-0.03
School size			-0.04	-0.04
School socioeconomic status			0.19	0.23
Receipt of Title I funding			0.01	0.03
School region: Midwest			-0.08	-0.08
School region: Northeast			-0.13	-0.13
School region: West			-0.05	-0.06
School urbanicity: central city			0.05	0.04
School urbanicity: fringe/large town			-0.03	-0.05
Moderating variables				
Parents' academic expectations				0.17
Parents' depression				-0.04
Children's behavioral self-regulation				0.14
Children's interpersonal skills				-0.06
Interactions				
Poor x academic expectations				-0.11*
Poor x depression				0.03
Poor x behavioral self-regulation				-0.27
Poor x interpersonal skills				0.25
Low-income x academic expectations				-0.06
Low-income x depression				0.04
Low-income x behavioral self-regulation				-0.07
Low-income x interpersonal skills				0.07

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 1,506 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D3. Results of Multilevel Models Predicting Parental Involvement at School for Latino/a Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-1.10***	-0.78***	-0.62***	-0.10
101-200% of the FPL (low-income)	-0.63***	-0.44***	-0.32**	1.36+
Family characteristics				
Parent education		0.34***	0.30***	0.27***
Mother employed full-time		-0.24**	-0.31***	-0.34***
Mother employed part-time		-0.01	-0.06	-0.04
Father employed full-time		0.07	0.05	0.02
Father employed part-time		0.04	0.07	0.03
Family structure (two-parent)		0.11	0.11	0.02
Individual-level control variables				
Age (years)			-0.01	-0.03
Gender (female)			0.21**	0.18*
Year in kindergarten (first)			0.32	0.34+
Pre-K relative care			0.10	0.12
Pre-K non-relative care			0.20	0.18
Center-care enrollment			0.11	0.10
Head Start enrollment			-0.01	-0.04
Other type of child care			0.12	0.14
Assessment language status (Spanish)			-0.13	-0.06
Timing of assessment (days from start)			0.01*	0.01+
School-level control variables				
Sector (private)			0.30	0.28
School size			-0.06	-0.09
School socioeconomic status			-1.07***	-1.10***
Receipt of Title I funding			0.25*	0.22*
School region: Midwest			-0.08	-0.01
School region: Northeast			-0.69***	-0.64***
School region: West			0.15	0.15
School urbanicity: central city			0.05	0.03
School urbanicity: fringe/large town			0.11	0.12
Moderating variables				
Parents' academic expectations				0.25***
Parents' depression				-0.16
Children's behavioral self-regulation				0.26
Children's interpersonal skills				-0.05
Interactions				
Poor x academic expectations				-0.14+
Poor x depression				0.15
Poor x behavioral self-regulation				-0.54*
Poor x interpersonal skills				0.50*
Low-income x academic expectations				-0.22**
Low-income x depression				0.02

Table D3 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				-0.05
Low-income x interpersonal skills				-0.19

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 1,707 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D4. Results of Multilevel Models Predicting Games/Puzzles for Latino/a Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.16**	-0.14*	-0.07	-0.22
101-200% of the FPL (low-income)	-0.13*	-0.11+	-0.07	-0.83+
Family characteristics				
Parent education		0.09***	0.07**	0.08**
Mother employed full-time		-0.14**	-0.20***	-0.19**
Mother employed part-time		0.01	-0.04	-0.04
Father employed full-time		-0.25**	-0.24*	-0.18+
Father employed part-time		-0.10	-0.05	-0.01
Family structure (two-parent)		0.28***	0.32***	0.36***
Individual-level control variables				
Age (years)			-0.09	-0.11
Gender (female)			-0.01	-0.02
Year in kindergarten (first)			0.05	0.05
Pre-K relative care			0.21**	0.20**
Pre-K non-relative care			0.09	0.13
Center-care enrollment			0.16*	0.18**
Head Start enrollment			0.07	0.13+
Other type of child care			0.10	0.17
Assessment language status (Spanish)			-0.13*	-0.09
Timing of assessment (days from start)			0.00	0.003+
School-level control variables				
Sector (private)			-0.02	0.01
School size			-0.05+	-0.05
School socioeconomic status			-0.09	-0.01
Receipt of Title I funding			0.04	0.01
School region: Midwest			0.14	0.17+
School region: Northeast			0.09	0.16+
School region: West			0.02	0.04
School urbanicity: central city			-0.05	-0.05
School urbanicity: fringe/large town			-0.07	-0.06
Moderating variables				
Parents' academic expectations				-0.03
Parents' depression				-0.13
Children's behavioral self-regulation				-0.20+
Children's interpersonal skills				0.24*
Interactions				
Poor x academic expectations				0.01
Poor x depression				0.18
Poor x behavioral self-regulation				0.06
Poor x interpersonal skills				-0.11
Low-income x academic expectations				0.05
Low-income x depression				0.27*

Table D4 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				0.26+
Low-income x interpersonal skills				-0.22

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 1,707 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D5. Results of Multilevel Models Predicting Building Activities for Latino/a Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.12*	-0.08	-0.05	0.63
101-200% of the FPL (low-income)	-0.02	0.00	-0.00	0.08
Family characteristics				
Parent education		0.06**	0.06*	0.05*
Mother employed full-time		-0.15	-0.16**	-0.16**
Mother employed part-time		0.02	-0.01	-0.02
Father employed full-time		0.15	0.19+	0.21*
Father employed part-time		0.03	0.06	0.07
Family structure (two-parent)		0.13	0.17*	0.17*
Individual-level control variables				
Age (years)			-0.10	-0.10
Gender (female)			-0.22***	-0.24***
Year in kindergarten (first)			-0.11	-0.11
Pre-K relative care			-0.01	-0.02
Pre-K non-relative care			-0.13	-0.13
Center-care enrollment			0.01	0.01
Head Start enrollment			0.01	-0.02
Other type of child care			0.11	0.07
Assessment language status (Spanish)			-0.21**	-0.18**
Timing of assessment (days from start)			0.003+	0.003+
School-level control variables				
Sector (private)			0.02	-0.03
School size			-0.04	-0.05+
School socioeconomic status			-0.01	-0.01
Receipt of Title I funding			0.09	0.08
School region: Midwest			0.04	0.08
School region: Northeast			0.07	0.11
School region: West			0.03	0.06
School urbanicity: central city			0.03	-0.00
School urbanicity: fringe/large town			-0.08	-0.09
Moderating variables				
Parents' academic expectations				0.08*
Parents' psychological well-being				-0.02
Children's behavioral self-regulation				-0.05
Children's interpersonal skills				0.16
Interactions				
Poor x academic expectations				-0.05
Poor x psychological well-being				-0.07
Poor x behavioral self-regulation				-0.34*
Poor x interpersonal skills				0.25+
Low-income x academic expectations				-0.03
Low-income x psychological well-being				0.19

Table D5 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				0.15
Low-income x interpersonal skills				-0.22

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 1,707 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D6. Results of Multilevel Models Predicting Reading Activities for Latino/a Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-0.29***	-0.18**	-0.12*	0.13
101-200% of the FPL (low-income)	-0.21***	-0.14**	-0.11*	-0.72*
Family characteristics				
Parent education		0.10***	0.08***	0.06**
Mother employed full-time		-0.04	-0.03	-0.01
Mother employed part-time		-0.06	-0.06	-0.06
Father employed full-time		0.12	0.11	0.14+
Father employed part-time		0.12	0.18	0.31*
Family structure (two-parent)		0.14*	0.17**	0.15*
Individual-level control variables				
Age (years)			-0.13*	-0.15*
Gender (female)			0.30***	0.30***
Year in kindergarten (first)			-0.12	-0.14
Pre-K relative care			-0.05	-0.01
Pre-K non-relative care			-0.08	-0.03
Center-care enrollment			0.12*	0.12*
Head Start enrollment			-0.10	-0.08
Other type of child care			0.06	0.07
Assessment language status (Spanish)			-0.19***	-0.18**
Timing of assessment (days from start)			0.00	0.00
School-level control variables				
Sector (private)			-0.14	-0.12
School size			0.02	0.01
School socioeconomic status			-0.25+	-0.23
Receipt of Title I funding			0.07	0.08
School region: Midwest			-0.01	0.00
School region: Northeast			-0.03	0.01
School region: West			-0.03	-0.04
School urbanicity: central city			0.02	-0.01
School urbanicity: fringe/large town			-0.03	-0.06
Moderating variables				
Parents' academic expectations				0.04
Parents' depression				-0.07
Children's behavioral self-regulation				-0.03
Children's interpersonal skills				0.03
Interactions				
Poor x academic expectations				-0.04
Poor x depression				0.09
Poor x behavioral self-regulation				-0.31**
Poor x interpersonal skills				0.24*
Low-income x academic expectations				0.04
Low-income x depression				0.00

Table D6 (continued)

Measure	Model 1	Model 2	Model 3	Model 4
Low-income x behavioral self-regulation				0.09
Low-income x interpersonal skills				0.04

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 1,707 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D7. Results of Multilevel Models Predicting Building Activities for European American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	0.15***	0.20***	0.19***	0.11
101-200% of the FPL (low-income)	0.10***	0.12***	0.09**	-0.07
Family characteristics				
Parent education		0.03*	0.04**	0.02*
Mother employed full-time		-0.12***	-0.09***	-0.10***
Mother employed part-time		-0.09**	-0.07*	-0.07*
Father employed full-time		0.09	0.09	0.10
Father employed part-time		0.23*	0.20*	0.20*
Family structure (two-parent)		0.12**	0.12***	0.13***
Individual-level control variables				
Age (years)			-0.10**	-0.09**
Gender (female)			-0.47***	-0.47***
Year in kindergarten (first)			-0.09	-0.10+
Pre-K relative care			-0.07+	-0.07
Pre-K non-relative care			-0.09*	-0.08+
Center-care enrollment			-0.06+	-0.06+
Head Start enrollment			0.11*	0.13*
Other type of child care			0.05	0.04
Timing of assessment (days from start)			-0.00	-0.00
School-level control variables				
Sector (private)			-0.04	-0.05
School size			0.01	0.02
School socioeconomic status			-0.24*	-0.21+
Receipt of Title I funding			0.05+	0.05+
School region: Midwest			-0.05	-0.04
School region: Northeast			0.03	0.04
School region: West			0.01	0.02
School urbanicity: central city			-0.01	-0.02
School urbanicity: fringe/large town			-0.01	-0.02
Moderating variables				
Parents' academic expectations				0.07***
Parents' depression				-0.04
Children's behavioral self-regulation				-0.04
Children's interpersonal skills				-0.00
Interactions				
Poor x academic expectations				-0.05
Poor x depression				-0.01
Poor x behavioral self-regulation				-0.00
Poor x interpersonal skills				-0.10
Low-income x academic expectations				-0.01
Low-income x depression				0.03
Low-income x behavioral self-regulation				0.14*
Low-income x interpersonal skills				-0.08

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 6,994 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D8. Results of Multilevel Models Predicting Games/Puzzles Activities for European American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	0.01	0.04	0.05	-0.02
101-200% of the FPL (low-income)	-0.01	0.00	0.01	0.46**
Family characteristics				
Parent education		0.03**	0.03**	0.01
Mother employed full-time		-0.06**	-0.04	-0.04
Mother employed part-time		-0.06*	-0.05+	-0.05+
Father employed full-time		0.05	0.06	0.04
Father employed part-time		0.06	0.06	0.03
Family structure (two-parent)		0.05	0.05	0.05
Individual-level control variables				
Age (years)			-0.01	-0.01
Gender (female)			-0.07***	-0.08***
Year in kindergarten (first)			0.07	0.04
Pre-K relative care			0.02	0.00
Pre-K non-relative care			-0.09*	-0.10**
Center-care enrollment			-0.06*	-0.07*
Head Start enrollment			0.06	0.09+
Other type of child care			-0.03	-0.06
Timing of assessment (days from start)			0.00	0.00
School-level control variables				
Sector (private)			-0.02	-0.01
School size			0.01	0.02
School socioeconomic status			-0.34**	-0.33**
Receipt of Title I funding			0.02	0.01
School region: Midwest			-0.05	-0.04
School region: Northeast			0.04	0.05
School region: West			-0.00	-0.01
School urbanicity: central city			0.04	0.02
School urbanicity: fringe/large town			0.06+	0.04
Moderating variables				
Parents' academic expectations				0.07***
Parents' depression				0.01
Children's behavioral self-regulation				-0.02
Children's interpersonal skills				0.06*
Interactions				
Poor x academic expectations				-0.00
Poor x depression				-0.01
Poor x behavioral self-regulation				-0.19*
Poor x interpersonal skills				0.22*
Low-income x academic expectations				-0.02
Low-income x depression				-0.14**
Low-income x behavioral self-regulation				0.09
Low-income x interpersonal skills				-0.16*

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 6,994 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D9. Results of Multilevel Models Predicting Reading Activities for European American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	0.06+	0.15***	0.17***	-0.54**
101-200% of the FPL (low-income)	-0.03	0.03	0.06*	0.24
Family characteristics				
Parent education		0.06***	0.06***	0.04***
Mother employed full-time		-0.02	-0.01	-0.01
Mother employed part-time		-0.01	-0.01	-0.00
Father employed full-time		-0.02	0.00	-0.01
Father employed part-time		-0.01	0.04	0.03
Family structure (two-parent)		0.03	0.02	0.02
Individual-level control variables				
Age (years)			-0.10***	-0.09***
Gender (female)			0.33***	0.31***
Year in kindergarten (first)			-0.02	-0.02
Pre-K relative care			-0.01	-0.02
Pre-K non-relative care			-0.04	-0.04
Center-care enrollment			0.03	0.03
Head Start enrollment			0.04	0.07
Other type of child care			-0.03	0.03
Timing of assessment (days from start)			0.00	0.00
School-level control variables				
Sector (private)			-0.10**	-0.10**
School size			0.00	0.00
School socioeconomic status			-0.23*	-0.20*
Receipt of Title I funding			0.00	0.01
School region: Midwest			0.01	0.03
School region: Northeast			0.03	0.03
School region: West			0.09**	0.11**
School urbanicity: central city			0.04	0.03
School urbanicity: fringe/large town			0.01	-0.00
Moderating variables				
Parents' academic expectations				0.08***
Parents' depression				-0.05*
Children's behavioral self-regulation				0.01
Children's interpersonal skills				0.03
Interactions				
Poor x academic expectations				-0.06*
Poor x depression				0.24***
Poor x behavioral self-regulation				0.07
Poor x interpersonal skills				0.13
Low-income x academic expectations				0.01
Low-income x depression				0.02
Low-income x behavioral self-regulation				0.02
Low-income x interpersonal skills				-0.09+

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 6,994 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table D10. Results of Multilevel Models Predicting Parental Involvement at School for European American Families

Measure	Model 1	Model 2	Model 3	Model 4
Family economic status				
100% or below the FPL (poor)	-1.20***	-0.80***	-0.70***	-1.31***
101-200% of the FPL (low-income)	-0.52***	-0.28***	-0.24***	-0.37
Family characteristics				
Parent education		0.29***	0.27***	0.25***
Mother employed full-time		-0.24***	-0.26***	-0.27***
Mother employed part-time		0.17***	0.16***	0.13**
Father employed full-time		0.42***	0.39***	0.36***
Father employed part-time		0.12	0.11	0.06
Family structure (two-parent)		0.36***	0.34***	0.28***
Individual-level control variables				
Age (years)			0.08+	0.05
Gender (female)			0.02	-0.04
Year in kindergarten (first)			0.05	-0.01
Pre-K relative care			0.04	0.07
Pre-K non-relative care			0.09	0.11+
Center-care enrollment			0.14**	0.16**
Head Start enrollment			-0.11	-0.08
Other type of child care			0.12	0.15+
Timing of assessment (days from start)			-0.01***	-0.01***
School-level control variables				
Sector (private)			0.03	0.05
School size			-0.05*	-0.04+
School socioeconomic status			-1.16***	-1.13***
Receipt of Title I funding			0.14*	0.14*
School region: Midwest			-0.15*	-0.12+
School region: Northeast			-0.21**	-0.19*
School region: West			0.09	0.08
School urbanicity: central city			0.21**	0.19**
School urbanicity: fringe/large town			0.24***	0.20**
Moderating variables				
Parents' academic expectations				0.06**
Parents' depression				-0.11
Children's behavioral self-regulation				-0.05
Children's interpersonal skills				0.26***
Interactions				
Poor x academic expectations				0.13**
Poor x depression				0.03
Poor x behavioral self-regulation				0.03
Poor x interpersonal skills				0.03
Low-income x academic expectations				0.03
Low-income x depression				0.06
Low-income x behavioral self-regulation				0.00
Low-income x interpersonal skills				-0.01

Note. Unstandardized *b* coefficients presented. Above 200% of the FPL was the reference category for poverty dummy variables, mother/father not employed was the reference category for mother/father employment status, no pre-kindergarten enrollment was the reference category for pre-kindergarten enrollment, South was the reference category for school region, small town/rural was the reference category for school urbanicity. n = 6,994 (all models). + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

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